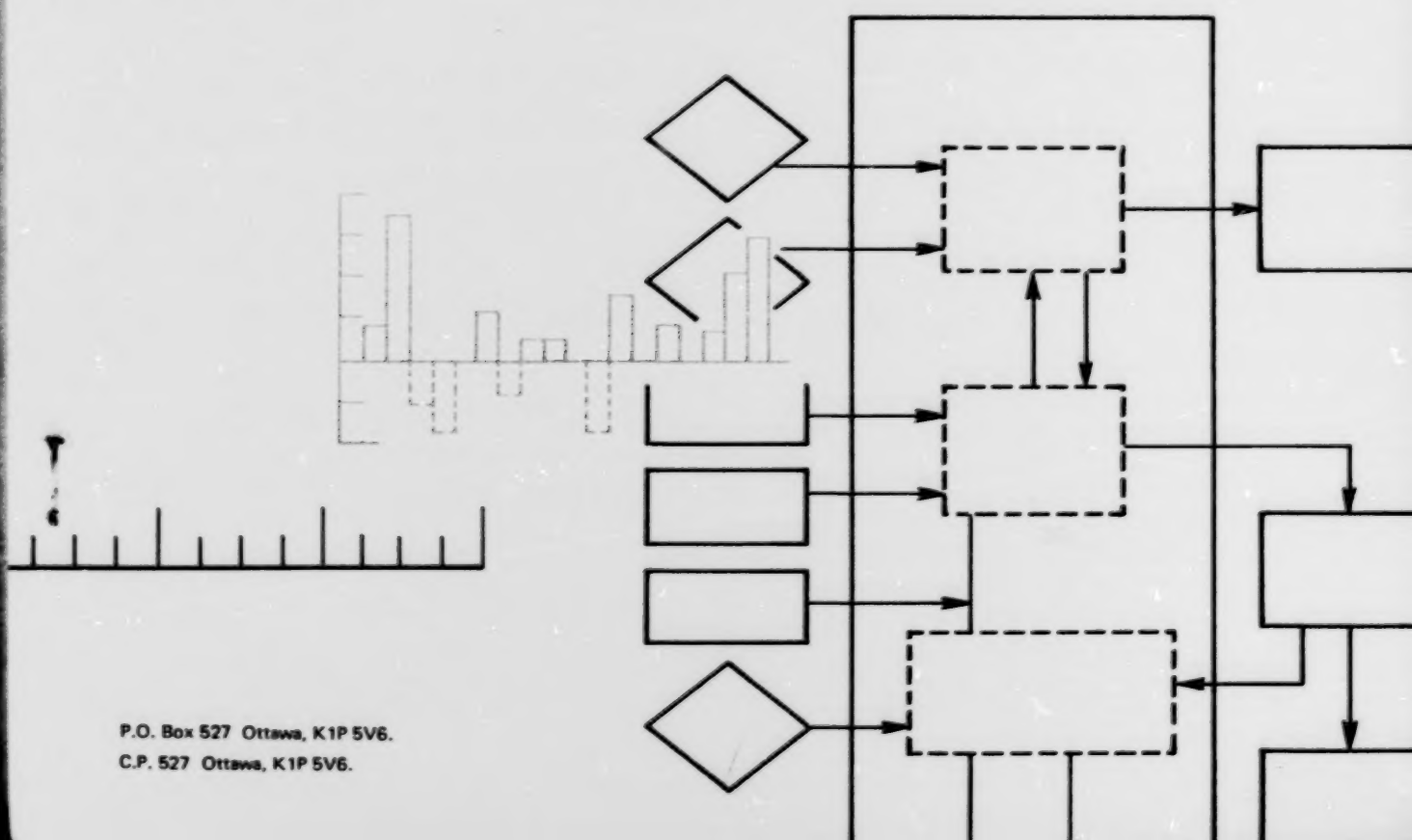
A paper prepared for the

Economic Council of Canada

Un document préparé pour le

Conseil économique du Canada



P.O. Box 527 Ottawa, K1P 5V6.
C.P. 527 Ottawa, K1P 5V6.

The **Economic Council of Canada** was established in 1963 by Act of Parliament. The Council is a crown corporation consisting of a Chairman, two Directors and not more than twenty-five Members appointed by the Governor in Council.

The Council is an independent advisory body with broad terms of reference to study, advise and report on a very wide range of matters relating to Canada's economic development. The Council is empowered to conduct studies and inquiries on its own initiative, or if directed to do so by the Minister, and to report on these activities. The Council is required to publish annually a review of medium- and long-term economic prospects and problems. In addition it may publish such other studies and reports as it sees fit.

The Chairman is the Chief Executive Officer of the Council and has supervision over and direction of the work and staff of the Council. The expenses of the Council are paid out of money appropriated by Parliament for the purpose.

The Council as a corporate body bears final responsibility for the *Annual Review*, and for certain other reports which are clearly designated as *Council Reports*. The Council also publishes *Research Studies*, *Discussion Papers* and *Conference Proceedings* which are clearly attributed to individual authors rather than the Council as a whole. While the Council establishes general policy regarding such studies, it is the Chairman of the Council who bears final responsibility for the decision to publish authored research studies, discussion papers and conference proceedings under the imprint of the Council. The Chairman, in reaching a judgment on the competence and relevance of each author-attributed study or paper, is advised by the two Directors. In addition, for *authored Research Studies* the Chairman and the two Directors weigh the views of expert outside readers who report in confidence on the quality of the work. Publication of an author-attributed study or paper signifies that it is deemed a competent treatment worthy of public consideration, but does not imply endorsement of conclusions or recommendations by either the Chairman or Council members.

Établi en 1963 par une Loi du Parlement, le **Conseil économique du Canada** est une corporation de la Couronne composée d'un président, de deux directeurs et d'au plus vingt-cinq autres membres, qui sont nommés par le gouverneur en conseil.

Le Conseil est un organisme consultatif indépendant dont le mandat lui enjoint de faire des études, donner des avis et dresser des rapports concernant une grande variété de questions rattachées au développement économique du Canada. Le Conseil est autorisé à entreprendre des études et des enquêtes, de sa propre initiative ou à la demande du Ministre, et à faire rapport de ses activités. Chaque année, il doit préparer et faire publier un exposé sur les perspectives et les problèmes économiques à long et à moyen termes. Il peut aussi faire publier les études et les rapports dont la publication lui semble opportune.

Le président est le directeur général du Conseil; il en surveille les travaux et en dirige le personnel. Les montants requis pour acquitter les dépenses du Conseil sont prélevés sur les crédits que le Parlement vote à cette fin.

En tant que personne morale, le Conseil assume l'entière responsabilité des *Exposés annuels*, ainsi que de certains autres rapports qui sont clairement désignés comme étant des *Rapports du Conseil*. Figurent également au nombre des publications du Conseil, les *Études*, *Documents* et *Comptes rendus de colloques*, qui sont explicitement *attribués à des auteurs particuliers* plutôt qu'au Conseil lui-même. Celui-ci établit une politique générale touchant ces textes, mais c'est au président qu'il incombe de prendre la décision finale de faire publier, sous les auspices du Conseil économique du Canada, les ouvrages à nom d'auteur tels que les études, documents et rapports de colloques. Pour se prononcer sur la qualité, l'exactitude et l'objectivité d'une étude ou d'un document attribué à son auteur, le président est conseillé par les deux directeurs. De plus, dans le cas des *études à nom d'auteur*, le président et les deux directeurs sollicitent l'avis de lecteurs extérieurs spécialisés, qui font un rapport confidentiel sur la qualité de ces ouvrages. Le fait de publier une étude ou un document à nom d'auteur ne signifie pas que le président ou les membres du Conseil souscrivent aux conclusions ou recommandations contenues dans l'ouvrage, mais plutôt que l'analyse est jugée d'une qualité suffisante pour être portée à l'attention du public.

DISCUSSION PAPER NO. 227

Government Grants to Private Sector Firms

by H. H. Binhammer
L. C. McDonough
G. Lepore

The findings of this Discussion Paper are the personal responsibility of the authors and, as such, have not been endorsed by Members of the Economic Council of Canada.

Discussion Papers are working documents made available by the Economic Council of Canada, in limited number and in the language of preparation, to interested individuals for the benefit of their professional comments.

Requests for permission to reproduce or excerpt this material should be addressed to:

Council Secretary
Economic Council of Canada
Post Office Box 527
Ottawa, Ontario
K1P 5V6

ISSN-0225-8013

April 1983

RÉSUMÉ

Ce document analyse les différents programmes de subventions directes en capital mis en place par les gouvernements fédéral et provinciaux. Chacun des programmes est analysé du point des objectives poursuivis et des dépenses qui ont été effectuées à travers la période 1969-1979. Il reste établi que le gouvernement fédéral a recours à des programmes de subventions directes en capital dans la mise en application de ses politiques dans six domaines : 1) la recherche industrielle; 2) l'ajustement à des nouvelles conditions de marché; 3) l'encouragement des exportations; 4) la croissance régionale; 5) le développement de secteurs clés; et 6) l'élimination des déséconomies externes. Les gouvernements provinciaux participent aux programmes fédéraux, particulièrement ceux qui s'adressent aux disparités régionales où établissent leurs propres programmes qui reflètent des préoccupations provinciales spécifiques.

Parce que les subventions directes en capital sont seulement une des façons de subventionner des entreprises privées, nous avons construit un modèle qui permet une comparaison avec les subventions implicites incorporées dans les prêts de l'Etat. Il est établi que les prêts subventionnés peuvent être différenciés des subventions en capital seulement dans la mesure où des contraintes existent qui limitent la valeur de la

subvention implicite incorporée dans les prêts. De plus, la subvention par le biais de subventions directes en capital minimise l'impact dérivé de l'intervention de l'Etat sur les marchés financiers. Enfin, l'on soutient que la méthode par laquelle une subvention est distribuée est secondaire au problème relatif à la décision de subventionner.

ABSTRACT

This study surveys the various grant programs instituted by both the federal and provincial governments. Each of the major gant programs is discussed in terms of its objectives and its expenditures over the period 1969 to 1979. The federal government is found to resort to grant programs as policy instruments in six areas: i) industrial research and development; ii) adjustment to new market conditions: iii) encouragement of exports; iv) regional growth; v) key sector development; and vi) removal of external diseconomies. Provincial governments either participate in federal programs, especially those aimed at regional disparities,or establish programs which reflect specific provincial concerns.

Because grants are only one way of subsidizing private firms, we construct a model which allows a comparison of the subsidies involved in particular types of government loans. It is found that loans can be differentiated from grants only to the extent that constraints may exist which limit the value of the implicit subsidy of a particular loan program. Also, subsidies via direct grants will minimize any possible effect of the government in credit markets. Finally, it is argued that the method of delivery of a subsidy is secondary to the problem of deciding upon an appropriate subsidy for any particular case.

TABLE OF CONTENTS

		Page
Introduction		1
Chapter I	An Overview of Government Grant Programs and Their Policy Objectives	6
	A. Federal Government Policy Objectives and Grant Programs	6
	1. Programs to Stimulate Industrial Research, Innovation and Product Development	7
	2. Programs for Assistance to Adjust to Changing Market Conditions	17
	3. Programs to Develop and Expand Export Markets	19
	4. Programs to Stimulate Regional Industrial Growth	21
	5. Programs for Key Sector Development	24
	6. Programs to Induce the Removal of Undesirable Externalities	29
	B. Provincial Government Grant Programs	30
	1. An Overview	30
	2. Société de development industriel du Québec	33
	C. General Development Agreements	39
Chapter II	The Dimensions of Grant Expenditures	46
	A. Estimates of Total Expenditures, Fiscal Year 1978-79	46
	B. Expenditures Under Major Federal Programs	46
Chapter III	A Model of Public Aid to Private Enterprise	69
	A. Introduction: Loans and Grants	69
	B. The Model	70
	1. Government Objective Functions	70
	2. The Firm's Objective Function	75
	3. A Market for Loans and Grants	77
	C. Grants	83
	D. Alternative Financial Aid Instruments	87
	E. Conclusions	88
	F. An Example	90

Chapter IV	Alternative Economic Rationales for Grant Programs	98
	1. The Lowering of Fixed Costs	98
	2. Increased Exports	99
	3. The Removal of Credit Gaps	100
	4. Distributive Goals	102
	5. Allocative Effects	103
	6. Conclusions	105
Chapter V	Conclusions	108
Appendix A	A Guide to Selected Studies Relating to Grant Programs	112
References		119

TABLES

I-1	Provincial Government Grant Programs to Private Sector Firms	31-32
I-2	Société de development industriel du Québec: Grants, Loans, Equity Participation and other as a Percent of Total Financial Assistance	35
I-3	Societe de development industriel du Quebec: Grants (Interest Rebates) Authorized Under Different Programs	35
II-1	Grants to Business Under Major Federal Programs: Canada 1969/70-1978/79	47
II-2	Financial Incentives to Business Committed Under Subsidiary Agreements of General Development Agreements signed Before March 31, 1979	49
II-3	Grants to Business in Perspective	52
II-4	Provincial Repartition of Major Federal Grants Expenditures for 1978/79	54
II-5	Provincial Repartition of Grants	55
II-6	Distribution of Grants by Size -- 1978/79	58
II-7	Distribution of Grant Size -- Selected Programs	59-60
II-8	Grant Expenditures by Sector	62
II-9	Grants to Large Companies	65
II-10	Distribution of IRAP Grants by Company Size	66

ACKNOWLEDGEMENT:

We would like to thank Sheila MacDonald for her valuable assistance in obtaining and organizing much of the statistical data for this study. We would also like to thank Mr. A. Ryba and Mr. S. Gera of the Council for comments made on earlier drafts.

INTRODUCTION

The primary purpose of this study is to define and differentiate government grants from other forms of public financial aid to private businesses. We begin by showing the extent to which government grants to businesses exist in our economy. Major grant programs are identified by name, objectives, size and distribution. Only brief mention is made of the effectiveness of programs in their achievement of policy goals since this has been the subject of detailed analysis elsewhere (Gillespie and Kerr (1977), Sharwood (1976) Ernst and Whinney (1980) and others).

After describing the grant environment we attempt to model the economic rationale of the choice between grants versus direct government loans from the firm's and the government's point of view. Within the framework of our model, we consider alternate tools of government aid to business. We also use the model to reconsider the stated objectives and stated rationales of many of the grant programs.

To anticipate our conclusions somewhat, we find that the use of grants rather than direct loans reduces greatly the probable impact on financial markets that would be caused by the sole use of direct government loans. Furthermore, we find that the issue to be resolved is not the tool to be used in giving aid, but rather, the value of the aid that ought to be provided.

DEFINING GRANTS AND GRANT EQUIVALENTS

Grants by governments to industry are usually included under the rubric of subsidies. One can differentiate among subsidies according to the technique used for their delivery; e.g. tax subsidies, insurance subsidies, product subsidies and credit subsidies.

An analytically clear and operationally useful definition of a grant cannot be made unequivocally. For our purpose, we define a grant as a discretionary money transfer (or cash payment) to a business to finance specified expenditures. While a grant does not imply a quid pro quo in terms of the provision of goods and services, it does require a firm to undertake specified expenditures. Such expenditures may involve the establishment, relocation or expansion of a firm's operations within a designated geographic area, the introduction of new technology and products, the penetration of new markets or the removal of undesirable externalities. A grant may also serve as an incentive or performance payment to businesses to change the timing, growth or pattern of their capital investments. The incentive effect of a grant may also be identified as the sharing by government with businesses of the costs of risks associated with capital projects.

Because a grant, as defined, assumes a specified response from the recipient, it is differentiated from a gift

which usually implies no response other than, perhaps, an expression of gratitude.

A capital grant may be functionally equivalent to an investment tax credit. Both techniques have been used to induce a change in behaviour by firms. However, whereas a tax credit allows a firm to retain funds it otherwise would have to transfer to government via the tax system, a grant involves the actual transfer of funds from government to firms. Under present taxation procedures, assistance in the form of tax credits is only available to those firms who have taxable income against which tax credits apply.[1] Another difference between a grant and a tax credit is that while a grant must be requested by a potential recipient, a tax credit is automatically received by all firms who have taxable income and who undertake expenditures eligible for tax credit. For the reasons given, we exclude tax credits from our definition of grants.

Aside from direct grants, which by their nature may be said to be explicit, other credit programs give implicit grants or grant equivalents to private sector firms. For example, grant equivalents are contained in government loans with interest payment holidays or at interest rates less than market rates.[2] Government loan guarantees contain grant elements to the degree that the fee charged does not capture the true risks involved.

The tax system, commercial policy, government regulations of one type or another, government sales and purchases, are other means by which private sector firms may receive government grant equivalents. Our list is by no means exhaustive.

Grants to private sector firms are variously identified in enabling legislation and government accounts. For example they may be shown as grants (repayable or non-repayable), contributions, incentive payments, forgivable loans, performance payments, interest rebates, subsidies or compensation payments. Hence the reader must be forewarned that, in spite of our attempt to define a grant, some discretion was exercised in collecting and presenting data on grants and grant equivalents.

FOOTNOTES

1. Professor Dan Usher has suggested to us that one could readily extend the benefit of tax credits to all firms by allowing firms to sell their rights to eligible taxable income unused for tax credit purposes to firms who wish to undertake additional investment but are unable to benefit from tax credits because they lack eligible taxable income.

2. Assuming that all other terms of a government loan are similar to one obtained from the private sector, the grant equivalent of a government loan may be inferred from the difference between the market rate and the government rate. This is analysed in Chapter III.

AN OVERVIEW OF GOVERNMENT GRANT PROGRAMS AND THEIR POLICY OBJECTIVES

A. Federal Government Policy Objectives and Grant Programs

In this section we identify the major federal government grant programs to induce and assist private sector firms to achieve specified objectives. The immediate policy objectives of federal government assistance may be summarized as follows:

(i) to stimulate industrial research, innovation, product development and productivity improvement;

(ii) to assist private sector firms to adjust to changing market conditions;

(iii) to develop and expand export markets;

(iv) to stimulate regional industrial growth;

(v) to develop "key" sectors of the economy, and

(vi) to remove undesirable externalities.

Underlying these immediate objectives are longer term goals to expand the Canadian industrial base and to create job opportunities, especially in those regions plagued by persistent higher unemployment and lower real per capita income than the Canadian average.

Insofar as we focus on grant programs we present an incomplete picture of the totality of government financial assistance to private sector firms. Moreover, while we fit the various programs into the immediate objectives listed above, as we shall see, many programs have been designed to

achieve more than one goal.

The major federal government programs providing financial assistance in the form of grants to private sector firms are:

Industrial Research Assistance Programs (IRAP)
Defence Industry Productivity Programs (DIPP)
Enterprise Development Program (EDP) - which in 1977 absorbed
- Program for Advancement of Industrial Technology (PAIT)
- Program to Enhance Productivity (PEP)
- Industrial Design Assistance Program (IDAP)
- General Adjustment Assistance Program (GAAP)
- Footwear and Tanning Industry Adjustment Program (FTIAI
- Automotive Adjustment Assistance Program (AAAP)
- Pharmaceutical Industry Development Assistance Program (PIDA)

Industrial Research and Development Act (IRDIA)
Program for Export Market Development (PEMD)
Shipbuilding Industry Assistance Program (SIAP)
Regional Development Incentives Act (RDIA)
Industry Energy Research and Development Program (IERD)

1. Programs to Stimulate Industrial Research, Innovation and Product Development

(i) The federal government's active involvement in promoting research that could ultimately lead to a deepening of the country's industrial base had its beginning with the appointment in 1916 of The Honorary Advisory Committee For Scientific and Industrial Research. In the following year, the Committee was reconstituted and became the National Research Council (NRC). In 1962, with the introduction of the Industrial Research Assistance Programme (IRAP), the Council started to give financial assistance directly to private sector companies to encourage them to set up, on a

permanent basis, research teams to undertake applied industrial research projects. Today the program provides grants to companies, which cover up to 50 per cent of the cost, mostly salaries and wages of scientists engineers and technicians, who are added to a company's staff to undertake research projects which have a high probability of leading to significant technological advances. A so-called Mini-IRAP program assists firms not large enough to maintain their own research facilities. Cost-sharing grants are available to pay the salaries of scientists working on projects undertaken on behalf of business clients by research organizations.[1]

The growth of the IRAP program is reflected in government's funding contribution. This increased from $6.3 million in 1969-70 to $18 million in 1978-79. In fiscal year 1978-79 IRAP grants supported some 834 professional and 559 technical positions in private sector firms.

(ii) The Defence Research Board, created in 1947 to foster research directly related to defence, introduced in 1961 The Defence Industries Research (DIR) Program. Its aim was to improve the ability of Canadian companies to compete for research, development, and ultimately production contracts by assisting them to increase their research and development facilities as well as personnel. Initially contracts were negotiated with companies, but in 1963, when this procedure

proved to be unnecessarily cumbersome and slow, contracts were replaced with cash grants.

The Defence Development Assistance Programme, the first predecessor of the current Defence Industries Productivity (DIP) Programme, was introduced in 1959 to support the Canada-United States Defence Production Sharing Agreement concluded during the previous year. The initial programme supporting defence industries was also in response to the Federal Government's decision to cancel the Avro "Arrow" aircraft project and to discontinue the development of major weapons systems exclusively for Canadians defence requirements. Support was in the form of cost-sharing grants up to 50 per cent for research, development, test and evaluation of military equipment for sale to allied government. Because defence industries in other countries received government support, it was considered necessary to provide similar financial assistance to Canadian companies to allow them to compete successfully in international markets. For instance, when the aerospace industry in the United States installed in the early 1960's a new generation of advanced production and test equipment with government assistance, the Canadian government, similarly, broadened its support programme.

In 1968, the purely military orientation of DIPP was modified with the addition of defence-related, civil, high

technology projects. This was to respond to industrial development opportunities in the aerospace industry and to decrease this industry's dependence on unpredictable military markets.

The expressed objectives of the DIP Program is now "to develop and sustain the technological capability of the Canadian defence industry for the purpose of generating economically viable defence exports and related civil exports arising from that capability". According to the government's directive, "the Program operates in support of international defence co-operative agreements for research, development and production.[2] Program support is directed to projects which will assist in maintaining the defence industry base in areas where Canada has special skills, to projects which support DND requirements, and to projects with significant potential for defence export sales, or sales to defence-related civil export markets".

Three types of aid are available under the DIP Program: innovative project development, capital assistance, and source establishment. For innovative project development, generally called R&D projects, grants are made to companies of up to 50 per cent of the cost of developing new products. Grants in excess of 50 per cent may be provided if there are special circumstances or unusual risks to justify an increased contribution. Capital assistance for upgrading manufacturing

equipment in defence-related industries consists of a 50 per cent grant as well as a 50 per cent interest-free loan repayable over five years. Capital assistance projects have a matching investment requirement; that is, the company is expected to upgrade its facilities by an amount equal to the grant and the loan. So-called source establishment grants of up to 50 per cent are available to Canadian companies to absorb non-recurring front-end contract costs when competing against foreign defence industries.

In each of the 1978-79 and 1979-80 fiscal years total DIPP grant payments amounted to $52.2 million. Since the inception of the program in 1959 some three-quarter billion dollars of grant assistance has been provided. Of this amount, some 70 per cent has been received by firms undertaking innovative project development, 16 per cent for so-called source establishment and the remainder for capital assistance. A few large firms in the aerospace and related electric and electronics industries have been the major beneficiaries of the DIP Program. Of the sales that have been generated by firms as a result of grant assistance, an estimated 60 per cent have been in defence markets and 85 per cent have represented exports.

(iii) Upon introduction of the programme for the Advancement of Industrial Technology (PAIT) in 1965, C.M. Drury, the Minister of Industry observed that "Invention and innovation are important driving forces in a modern industrial

economy and economic progress stems in large measure from increased productivity based on new technology. Hence, one of the prime requirements for growth in the manufacturing sector is a high level of technical competence."[3] The PAIT program was designed to stimulate the exploitation by Canadian industry of scientific advances by underwriting the development of new or improved products or processes. The Programme also served to stimulate foreign-owned companies to increase their research activity in Canada. Unlike IRAP and the former DIR which focused on research, PAIT, as well as DIP, were primarily intended to act as a catalyst for technological innovations which would result in increased productivity and product development.

When PAIT was first launched, financial support was in the form of repayable loans of up to 50 per cent of the cost of a project. Where the results of a development project were put into commercial use, the recipient was obliged to repay the government's contribution together with interest based on the government's borrowing rate, within a period not exceeding ten years from the date of the first commercial sale or first commercial use by the grant recipient company. The incentives offered by the programme were insufficient to interest many firms and, as a consequence, in 1970 the repayment obligation was dropped. At the same time, product and product engineering costs became eligible for grants. Generally, grants were made for current costs of development

projects including certain pre-production costs of a non-recurring nature and costs incurred for pilot plants and special purpose equipment.

Before PAIT became incorporated into the new Enterprise Development Program in 1977, the average annual amount of cost-sharing grants paid by the government amounted to a little over $25 million. Some of the provincial governments have complementary programmes which offer grants up to 25 per cent of the cost of feasibility studies in addition to the 50 per cent offered by PAIT, now the grant available by EDP, the successor program outlined below.

(iv) The Program to Enhance Productivity (PEP) was introduced in 1971 to encourage firms to undertake studies of the feasibility of significant and imaginative projects likely to improve production efficiency. While PAIT was orientated to the conceptual, developmental and pre-production phases of the product cycle, PEP was focused on the production cycle. Grants were offered (to a maximum of $50,000 each) to support up to one-half the approved costs of such studies undertaken by manufacturing and processing industries. In addition, grants offered up to 25 per cent of the cost of market analysis. In the five years before it became part of the Enterprise Development Program the average annual expenditures for grants under the program were a little over $600,000.

(v) The Industrial Design Assistance Program (IDAP), also introduced in 1971, was intended to promote the development and application of design in Canadian industry. The government shared up to 50 per cent of the cost of new or incremental design activity undertaken by companies. The program also became part of the Enterprise Development Program in 1977. In the last five years during which the program had its separate identity, average total annual grant payments were $444 thousand.

(vi) The Enterprise Development Program (EDP) was introduced in 1977 as an amalgamation of seven existing programs; PAIT, PEP and IDAP referred to above and four programs under which private sector firms received government loans and loan guarantees.[4] Although more government funds are absorbed in other programs, EDP now represents the Federal Government's main instrument for promoting industrial development.[5]

EDP is administered by the Federal Department of Industry and Commerce and grant requests are reviewed by regional and national Enterprise Development Boards composed of both private and public sector representatives.

Under the EDP, financial assistance, in the form of cost-sharing grants and last resort loan guarantees, is provided to small and medium-sized firms in the manufacturing and processing sectors. Firms in the services sector are also eligible if the assistance would directly provide significant benefits for firms in manufacturing or processing, or

if these are high technology service firms.

The EDP program provides grants for innovative assistance and loans or insurance for term loans for adjustment assistance to private sector firms. Grants up to a maximum of $100,000 are available to share the costs of projects involving proposal preparation, identification of new products, market exploitation, or productivity enhancement. However, for product development and design the maximum $100,000 limit does not apply, and instead, firms with sales in excess of $10 million the limit is 50 per cent of elibible project costs while firms with a smaller sales volume may receive up to 75 per cent of eligible project costs.

The EDP program is intended to support technologically innovative projects which have potentially significant economic benefits to Canada, and which, because of the risks to a firm, would not go forward without some form of assistance. However, to be eligible for a grant both the project and the firm must demonstrate their viability. Moreover, to qualify for a grant, a company must demonstrate that total project costs represent a significant financial burden and risk to the enterprise in terms of its tangible net worth and prior year's cash flow. This "significant burden" criterion presumably assures incrementality, that is, the project would not ordinarily be undertaken without government assistance and the major recipients of assistance are small and medium sized firms.

In 1977-78 and 1978-79 the government's grant contributions under EDP was $34 million and $23 million respectively.

(vii) The Industrial Research and Development Act (IRDIA) of 1967 had as its objective the inducement of Canadwan corporations to undertake additional research and development likely to result in economic benefit to Canada through the eventual production of new and improved products and processes. It replaced the General Tax Incentive Program of 1962 which allowed firms to deduct for tax purposes 100 per cent of their current capital research expenditures and an additional 50 per cent of such expenditures which exceeded those made in the 1961 base year. Before an amendment to IRDIA in 1976 which terminated payment of grants for research and development expenditures incurred after December 31, 1975, Canadian corporations could apply for cash grants or credits against their federal income tax liability amounting to 25 per cent of their current scientific research and development expenditures and a further 25 per cent for increases in such expenditures over the average during the five preceding years. Grants made under the Act were exempt from federal income tax and did not reduce capital cost allowance under the Income Tax Act.

Applications for grants had to be submitted retroactively However, on request a corporation could receive a prior opinion as to whether anticipated projects would be likely to qualify as being scientific research and development and likely to

benefit Canada.[6] In 1970 a system of partial payment of grants was started. This enabled companies in certain circumstances to receive the benefits under IRDIA sooner without tying up their own funds.

By the end of the government's 1977-78 fiscal year, 3,047 Canadian corporations had made a total of 8,957 applications for grants under the Act. A total of 8,415 grants amounting to $291.5 million had been authorized for payment.

(viii) The Industry Energy Research and Development Program (IERD) was introduced in October 1977 to assist companies to undertake the research and development of new and improved processes and to acquire equipment that will serve to reduce energy consumption. The program also helps to promote and market new technology. Grants are available for up to 50 per cent of the total project costs. The sharing ratio depends on the technical risk and the degree to which the results of the project can be used by other corporations. In the 1978-79 fiscal year, five grants were made for a total amount of $358,000.

2. Programs for Assistance to Adjust to Changing Market Conditions

(i) Assistance to industry to allow it to adjust to changing market conditions resulting from modified commercial policy became an important policy objective of government incentive programs only after the Kennedy Round of GATT

negotiations. In 1968, the General Adjustment Assistance (GAAP) Program was initiated to assist firms adversely affected by increased imports following the tariff concessions made by Canada. In June 1971, the program was broadened specifically to provide assistance for textile and footwear manufacturers to restructure their operations and adapt efficiently to import competition which might cause or threaten them with serious injury.

Assistance under the GAAP was in the form of government insurance for loans from commercial lenders, direct government loans, and grants covering up to 50 per cent of the cost of consulting services required to develop sound adjustment proposals. Before the Program was absorbed under EDP, most assistance was in the form of loan guarantees to textile manufacturers.[7] The EDP has continued this program by providing adjustment assistance in the form of loans or loan insurance to manufacturing and processing firms who have been injured by the Tokyo Round Tariff or the unilateral actions of foreign governments.

(ii) In the early 1970's, the Federal Government developed a total sector strategy for the footwear and tanning industry which focused on productivity improvement and marketing practices. The Footwear and Tanning Industry Adjustment Program (FTIAP) was introduced as the main vehicle for sector rationalization by providing financial assistance to promote mergers and growth by existing strong firms. Grants of 80

per cent of costs, up to $125,000 are available toward the fees of consultants to undertake a comprehensive analysis of a company's operation and to develop a restructuring plan.

Few grants have been made for consulting assistance and the total amount of loans extended has also remained relatively small. In 1978-79, for example, grants now administered as part of EDP, amounted to only $400,000, while $6.8 million of loans were made.

(iii) Industries undertaking adjustment programs may also benefit indirectly from labour force adjustment programs which provide cash transfers to labour or other assistance for retraining workers. These programs include the Canada Manpower Training Program (CMTP), the Canada Manpower Industrial Training Program (CMITP), the Canada Manpower Mobility Program (CMMP), and the Industrial Adjustment Assistance Program. By removing at least some of the labour problems resulting from industrial restructuring, corporations are made less reluctant to adjust their operations to changing market conditions.

3. Programs to Develop and Expand Export Markets

Insofar as some 25 per cent of domestic production is sold in foreign markets, sustaining and expanding export markets is an important policy objective of the federal government. Larger foreign sales not only generate and

increase domestic output and employment, but in many cases allow firms to experience economies of scale. The resulting increase in productivity allows Canadian firms to remain and even become more competitive, which in turn may widen foreign markets even further.

(i) The Program for Export Market Development (PEMD), initiated in 1971, is the federal government's main vehicle for encouraging Canadian companies to enter export markets or to undertake additional export activities. PEMD is a cost-sharing program which, by sharing risks and uncertainty, attempts to make it more attractive for Canadian producers to venture into foreign markets.

PEMD normally shares 50 per cent of consulting and other service costs associated with participation in major international projects such as the design and construction of power plants, hotels, airports and harbour facilities. The same is also the case for costs incurred by a company in identifying potential market opportunity or in adjusting or adapting marketing procedures to unfamiliar or changing conditions in foreign markets. Financial assistance is also available to Canadian manufacturers, especially small and medium sized firms, for completing comprehensive feasibility studies and for the formation and initial operating costs of export consortia.

PEMD also shares a company's costs of exhibiting in trade fairs and industrial exhibitions outside Canada, and

in bringing potential foreign buyers to Canada. Before it was absorbed by the EPD program, cost-sharing grants for similar purposes were available under the Promotional Projects Program.

Financial assistance under the program is in the form of a repayable loan in the sense that in the event that export sales result from a PEMD supported activity, the government's cost-sharing contribution is repayable.

From the program's inception in 1971 to March 31, 1979, $57.2 million in cost-sharing contributions were approved of which $28.8 million was expended and in turn $1.1 million repaid. Total reported sales resulting from the program have amounted to $3.7 billion which gives a cost to sales ratio over the expired life of the program of 1:128. That is, for every dollar contributed by the government, $128 in export sales have been reported.[8] The number of successful projects is 1,295 for which PEMD expended $4 million dollars and from which it has recovered $1.1 million, or 27 per cent of its expenditures on these projects. In addition to the PEMD program the federal government spends some $5 million dollars a year providing to firms services promoting international trade.

4. Programs to Stimulate Regional Industrial Growth

Although federal government programs to improve the regional economic balance of the country date from the 1920's,

it was not until after World War II that explicit policies of regional economic development were formulated. Moreover, it was only in the 1960's that cash grants to industry became a regular policy instrument for dealing with regional economic expansion.

(i) The Area Development Agency was set up in 1963 to provide incentives for firms to locate in designated areas of high unemployment. Until 1965, incentives were in the form of tax concessions and accelerated depreciation allowances to firms. However, in that year with the introduction of the Area Development Incentives Act (ADIA) the Agency's program of tax incentives was modified and a system of capital grants was introduced. Since it was felt that some firms might be reluctant to accept outright government grants, credits equivalent to the amount of a grant were also offered as a deduction from income tax liability. Grants were not considered income for tax purposes and were not deducted from the capital sum against which capital cost allowances were claimed.

(ii) The Regional Development Incentive Act, 1968-69, (RDIA) replaced the ADIA legislation of 1963 and grants under the latter were terminated on March 31, 1971. Under the Act, the Department of Regional Economic Expansion offers incentives in the forms of cash grants or, occasionally, loan guarantees to manufacturing and processing firms willing to establish, expand or modernize their operations in designated

regions of the country in order to create improved opportunities for productive employment. In 1979, these regions included Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island, Quebec (except for Hull and its environs), Northern Ontario, Northern Alberta, Northern British Columbia, and the Northwest Territories.

The amount of individual incentives have varied over the years according to the region in which the grantee is located and the nature of the project. In 1979, incentives for the construction of new facilities or the expansion of existing ones to produce new products were equal to 25 per cent of the investment value plus a percentage (15 to 30 per cent) of approved wages and salaries depending on the region. Incentives for modernizing facilities or increasing production capacity were equal to 20 per cent of the investment. Large-scale projects entailing investments of at least $1.5 million and the creation of at least 100 jobs were considered in light of their benefits and needs.

The Montreal Special Area Program of DREE, effective from July 1, 1977 to June 30, 1980, offers grants, conditionally repayable grants and specifically repayable grants to selected industries identified for strategic growth in the Montreal area. Only industries involved in the following activities are eligible for incentives: food industries dealing in prepared and quick frozen food, metal fabricating, transportation and equipment, electrical products, chemicals

and chemical products, scientific and professional equipment, and sporting goods and toys. By the end of its 1979 fiscal year, DREE commitments through offers made by the Montreal Special Area Program amounted to $14.5 million.

From the inception of RDIA in 1969 to December 31, 1979, 7,925 requests for grants amounting to $457 million had been approved. These approvals were based on eligible costs of $2 billion and on estimated 61.7 thousand direct jobs to be created.

(iii) As is explained in a separate section below, since 1974 the federal government's Department of Regional and Economic Expansion has signed Development Agreements with the provinces. Under these Agreements, specific Subsidizing Agreements have been negotiated which, inter alia, provide for joint federal-provincial financial assistance to firms located in designated areas. By March 31, 1979, $89.8 million in direct financial assistance to businesses had been committed under these subsidizing agreements. Of this amount the federal government's share was 58.7 per cent and the remainder was assumed by the respective provincial governments with whom agreements had been signed.[9]

5. Programs for Key Sector Development

Although the federal government does not appear to have a well defined plan for the country's industrial development or strategy, it has from time to time introduced

programs to sustain and develop certain industries, particularly for those related to defence production, for those employing advanced technology, for those adversely affected by changes in commercial policy, and for those engaged in export markets.

We have already noted the Defence Industry Productivity Program which provides grants to business to share the costs of developing defence related products for export purposes, to acquire machines and manufacturing equipment, to enhance their technological competence and productivity, and to meet pre-production expenses associated with establishing additional production capacity for export purposes. The Aerospace and related electric and electronics industries in particular have been a major beneficiary of the DIP Program.

(i) In 1980, the federal government undertook its first project of special assistance to the electronics industry, an industry which has received grants both under the DIP and EDP programs. This first project was a $21 million grant to be paid over a three year period to the Mitel Corporation to assist the company in a $72 million expansion for the development of large scale integrated circuits for telecommunications and related applications and new semiconductor technology. The grant will provide 50 per cent of the capital equipment and 75 per cent of the direct labor costs associated with the project. Mitel is restricted from

paying dividends until 1988 or until its obligations to the Government are discharged. To assure that Mitel does not come under non-Canadian control, the Government has been given first rights to purchase, under certain conditions, a specified number of the shares of the company.

(ii) The Pharmaceutical Industry Development Program (PIDA) was introduced in the early 1970's as a special sectorial program. The program, whose activities have since been absorbed into other existing programs, was intended to strength the ability of Canadian drug manufacturers to produce prescription drugs in competition with large foreign firms who dominate the industry. Assistance was primarily in the form of loans, which in 1972 during the program's peak year amounted to only $650 thousand.

The textile, footwear and tanning industries, as noted earlier, have also received special assistance to help and encourage them to restructure their activities to meet changing market conditions.

(iii) The shipbuilding industry has been singled out by the federal government for assistance because of the amount of employment it provides in regions which otherwise would have an extremely high unemployment rate and in part by a desire to have the industry survive in light of assistance other governments give to their own shipbuilding industry.

The Ship Construction Assistance Regulations (SCAR) begun in 1961 was replaced by The Ship Construction Subsidy Regulations (SCSR) in 1965 and The Shipbuilding Temporary Assistance Programme (STAP) was added in 1970. In 1975, The Shipbuilding Industry Assistance Programme (SIAP) replaced the then existing federal support programs. The SCAR and SCSR programs offered financial assistance, initially in the form of grants up to 40 per cent of the cost of ships constructed for domestic use and were intended to foster the development of the shipbuilding industry. The STAP assisted the construction of ships for export at a time when there was concern over employment conditions in the industry. The objectives of the SIAP are to improve the competitiveness of the shipbuilding industry in order to maintain stable employment and to improve productivity.

The SIAP initially offered a 14 per cent capital cost grant, for each ship built for domestic or export sale. After 1976, this grant rate was to be reduced by one percentage point per year until it reached 8 per cent.[10] In addition, an incentive grant of up to 3 per cent of the cost of vessels is available for the improvement of facilities and hence productivity. Such grants have to be matched by the shipyards receiving them.

In 1978-79 the federal government's contribution under SIAP was $59.2 million while over the previous ten years, the average annual federal outlay was $38.9 million.[11]

The number of grants has been small, but the dollar amounts have been large.

(iv) Another industrial sector which has received special attention is the Automotive Industry. Under the Automobile Assistance Program, now part of EDP, grants were made to allow the industry to adjust to the Canada - US Automotive Agreement of 1965, and more recently by the EDP, to overcome difficulties consequent upon the market's response to higher petroleum prices. In addition, the federal government has made a special grant of $40 million to the Ford Motor Company to establish an engine plant in Southern Ontario and a special loan guarantee to Chrysler Corporation to assist it to remain a viable company.

(v) More recently, as noted below, subsidiary General Development Agreements have been concluded by the federal government and the governments of Quebec and Ontario to provide special assistance to the pulp and paper industry.

(vi) Following the discontinuance in early 1980 of the super-depletion allowances for companies in frontier oil and gas exploration, it was reported that the federal government was considering incentive grants to these companies as an alternative form of assistance.[12] Under the depletion allowance provision, big companies with large earnings were the beneficiaries. In contrast, a grant program could be tailored to benefit not only primarily small and medium sized but also Canadian owned companies.

6. Programs to Induce the Removal of Undesirable Externalities

The underlying economic rationale of the policy objectives and related grant programs discussed so far, is to encourage private sector business investment which produce positive social benefits, that is, benefits in addition to those enjoyed directly by their creators. Alternatively, grants may be given to private sector firms as incentives for the removal of undesirable externalities, such as, damage to the environment resulting from existing modes of production.

(i) If Canadian governments require companies to reduce or eliminate undesirable externalities resulting from production and processing while foreign countries tolerate such externalities, Canadian companies have to absorb costs which decreases their competitiveness in domestic and international markets. In order to meet new environmental and other standards without having to internalize all the costs associated in doing so, the federal government has begun to offer special grants to certain industries. For example, under the Pulp and Paper Facilities Improvement Subsidiary Agreement with Ontario, $140.5 million in grants for pollution abatement had been authorized by mid 1980.[13] A similar agreement was signed with the Government of Quebec.

As part of its mandate, EDP provides shared-cost grants, without limitation, for projects involving research, development, adaption or demonstration of new or improved

technology, equipment or facilities designed for the elimination or reduction of pollutions emanating from a firm's manufacturing plant. To qualify for a grant, the project to be undertaken must represent a significant contribution toward pollution abatement and the firm must agree to disseminate the technology to other Canadian firms.

B. Provincial Government Grant Programs

1. An Overview

Assistance by most provincial governments to private sector firms takes the form of providing infrastructure, technical and managerial services, direct loans, loan guarantees, and equity participation. With the exception of Quebec, which has an extensive grant program involving interest rebates, and to a lesser extent Ontario, grant programs in other provinces are relatively small. By and large, the programs which used to be initiated and financed entirely from provincial budgets, have been overtaken by special programs cost-shared with the federal government's Department of Regional and Economic Expansion (DREE).

Provincial government grant programs, exclusive of the DREE cost-shared ones, are summarized in Table I-1. As is shown in the Table, except for Ontario and Quebec, the amount of expenditures in 1978-79 for grants to private sector firms were relatively small. Grants were made with

TABLE I-1

PROVINCIAL GOVERNMENT GRANT PROGRAMS TO PRIVATE SECTOR FIRMS
(EXCLUDING COST-SHARED DREE PROGRAMS)

OVINCE	PROGRAM	PURPOSE	DOLLAR EXPENDITURE 1978-79 FISCAL YEAR
wfoundland and brador	Market and Product Development Program	to increase export markets or provide for import substitution	34,500
nce Edward land	Training Programs	attend courses and seminars that aid in development of businesses	($29,000 in grants awarde under these programs of which 90% DREE funded)
	Counselling Assistance Program	management consulting services to small entrepreneurs	
	Student In-Industry Program	counsel small businessmen on new techniques and practices of management	
va Scotia	Product Design and Development Program	to upgrade design quality of existing products; develop and market new products and assist firms not eligible for assistance under Federal Program for Export Development	202,911
	Market Assistance Program		
	Rural Industry Program	to establish and expand industries in rural areas to create employment opportunities	
	Task Force, Industry Program	to employ additional labour	16,464
ew Brunswick	Urban Small Industry Program	to encourage establishment, expansion and modernization of small industries in urban areas	(started in April 1979) $596,000 forgivable loans in 1979-80 fiscal year
uebec	Société de developement industriel du Québec	to stimulate economic development, consolidate and transform industrial structure of Quebec	50,631,000
	Aide a la promotion des exports	to develop foreign markets	858,435

PROVINCE	PROGRAM	PURPOSE	DOLLAR EXPENDITURE 1978-79 FISCAL YEAR
Ontario	Program to Encourage Process Innovation	assistance to develop a prototype or new process	62,890
	Ontario Program for Advancement of Industrial Technology		182,228
	Product Design Development Program	to upgrade design and quality of new and existing products	74,940
	Loan forgiveness, Ontario Development Corporation		3,207,065
	Loan forgiveness North Ontario Development Corporation		782,023
Manitoba	Promotional Assistance Program		25,402
	Feasibility Studies Program		61,574
skatchewan	Product Development Program	develop new products, design and process	33,254
	Aid to Trade Program		93,732
	Small Business Interest Abatement Program	assist small industries by lowering interest rate on term financing	11
	Small Industry Development Program		242,447
	Management Development Program		13,049
Alberta	Development of Business and Tourism		830,726
	Natural Science and Engineering Research		17,900
British Columbia	Trade Show Assistance Program		56,489
	Trade Mission Program		308,135
	Incoming Buyers Program		23,758
	Market Development Assistance Program		88,449
	Technical Assistance Program		275,329

with the objective of expanding the industrial sector within a province by sharing . search and information costs associated with export marketing, more design, product and process development, and as in the case of Prince Edward Island, the use of modern managerial techniques. There were also programs specifically designed to assist small industries and tourism.

2. Société de developpment industriel du Québec (SDIQ)

In the province of Quebec direct assistance is provided through its Société de développment industriel du Québec (SDIQ). This government corporation was established under the Quebec Development Assistance Act of 1971 with the specific purpose of "stimulating the economic development and the transformation of the industrial structure of the province of Quebec by promoting better interrelations in business activity, increased participation of the population of the Province in economic activity, and the creation of new jobs; ...".

As of March 31, 1979, SDIQ administered the following six assistance programs:

(A) Financial assistance to firms for the introduction and expansion of modern technology.

(B) Financial assistance to manufacturers for mergers and acquisitions.

(C) Financing of manufacturing corporations.

(D) Financial assistance to exporters.

(E) Loans to small manufacturing corporations and

(F) Loans to traditional industrial sectors (hoisiery, footwear and furniture industries).

Subsequently two additional programs were added:

(G) Financial assistance to "dynamic" enterprises and

(H) Financial assistance to tourist enterprises.

The major objective of all these programs is to encourage industrial growth by the development of an industrial structure in the province of Quebec which reflects the use of advanced technology, high productivity and products the manufacture of which is not simply the primary conversion of natural resources.

Most financial assistance to firms, as shown in TableI-2 is in the form of grants which are interest rebates. As interest rebates these grants do not make firms ineligible for grants under various federal government programs. As is shown in Table I-3,most grants are made to firms for the introduction and expansion of modern technology. Although SDIQ can give interest rebates up to 50 per cent of the interest cost, in practice they are between 5 per cent and 30 per cent over a five year period calculated on the total capital investment in the project. The percentage applicable to each applicant depends in large part upon the

TABLE I-2

Société de développment industriel du Québec

Grants, Loans, Equity Participation and Other and Percent of Total Financial Assistance

	Grants	Loans	Equity	Other*	Total Dollar Amount
1979	65.59	27.17	3.14	4.10	77,197,860
1980	67.39	21.40	7.19	4.02	143,142,420
1971	40.60	32.80	4.02	22.56	837,128,626

* Mostly loan guarantees

Source: Société de développment industriel du Québec, Annual Report, various issues.

TABLE I-3

Société de développment industriel du Québec

Grants (Interest Rebates) Authorized Under Different Programs

	1978 - 1979		1979 - 1980		Cumulative Since Inception	
Program	NO	$(000)	NO	$(000)	NO	$(000)
. Technology	142	27,658	257	56,752	1065	245,287
. Merger	26	6,171	33	6,309	152	29,644
D. Export	68	16,802	134	31,208	293	62,767
G. Dynamic enterprises			17	1,729	17	1,729
H. Tourism			5	468	8	468
Total	236	50,631	446	96,467	1532	339,894

Source: Société de développment industriel du Québec, Annual Report, various issues.

proportion of capital equipment and other inputs purchased from manufacturers resident in the province. SDIQ not only encourages "buy Quebec" with this variable grant scheme but also provides a search and information service for applicants to direct them towards goods and services which may be purchased at competitive rates within the province. Interest rebates are paid at the end of each year, usually following on-site inspection confirming that specific objectives have been met.

Since 1979 grants are also made to firms ("entreprises dynamique") whose growth is above the average of their particular industrial sector. This program, as well as the technology program described above, are designed primarily to speed the pace of industrial production based on sound market decisions. SDIQ gives priority to requests for assistance to firms in sectors whose expansion it deems desirable for stimulating economic development and the efficient transformation of the province's industrial structure.

In 1979 when tourism was targeted as a sector with growth potential, a specific assistance program was introduced. In its first year five grants amounting to $468.5 thousand were made.

Grants in the form of interest rebates are also made to firms to increase their export sales outside of Canada. Eligible businesses are those with annual sales of less than $15 million or those with at least 50 per cent of their

shareholders resident in Quebec. The interest rebate offered is for a period of five years and may reach a maximum of 90 per cent of the interest cost. However, the rebate is conditional upon a significant improvement of the competitive position of the business in foreign markets during the five year period. The maximum rebate is calculated as 10 per cent of the percentage increase in sales from one year to the next. For example, if sales in any one year increase by 20 per cent, the maximum rebate would be 2 per cent of sales.

Grants are also offered to companies operating in the so-called traditional sectors (hosiery,, clothing, footwear and furniture industries) to regroup through mergers and acquisition. Eligible firms must be able to show that merged organizations can, as a result of regrouping, enjoy greater economies of scale, increased productivity and improved competitiveness in domestic and international markets. A newly formed company following merger or acquisition must be more than 50 per cent controlled by Quebec residents.

Loans and loan guarantees under the various financial assistance programs are usually offered by SDIQ as "last resort" and where firms are unable to borrow from the private sector at "reasonable" interest rates and conditions. Although there is legislative provision allowing SDIQ to forgive a loan to a firm which can demonstrate substantial

increases in business volumes and employment levels, this form of assistance is seldom now granted. Loans made by SIDQ are secured and as a rule are offered at the current market rate.[14] Eligibility and the amount of a loan are conditional upon significant improvement in a firm's competitive position as reflected by the increase in its production and sales and the proportion of inputs which have their origin in the province. As with grants, loan applications from firms in sectors which SIDQ considers to have stratigic growth potentials will receive priority.

Equity participation by SIDQ is also undertaken on a last resort basis. Terms for repurchase of shares are agreed upon at the time of SIDQ's offer to purchase. Equity financing normally takes place only where a company cannot repay a loan previously made or guaranteed by SIDQ.

Financial assistance to firms by SIDQ is usually associated with a specific capital investment project. However, under the programs for financing small manufacturing companies and firms in designated traditional sectors, loans are offered to increase a company's working capital or to consolidate its financial structure excluding the refinancing of existing debt.

From its establishment in 1971 to March 31, 1980, total financial assistance authorized under the different programs of SIDQ amounted to $837 million. As is shown in Table I-2, most of the assistance has been in the form of

grants and the proportion of grants to the total dollar amount of assistance has increased. Table I-3shows the grants authorized during the 1979 and 1980 fiscal years as well as the cumulative total since the inception of the different programs. During its 1979 fiscal year the average grant was about $225,000 and the average loan in the order of $200,000.

SIDQ takes a sector rather than a regional approach in allocating its funds. In practice most of the grants are made to medium sized and large firms whose expansion result in greater economies of scale and who are in sectors the government wishes to encourage because of their growth potential. Expansion of output is considered a more important indicator of eligibility for assistance than expected additional labour employed by a firm. Moreover, as already observed, production beyond the primary stages, as well as backward and forward linkages to other industries in the provinces receives high priority.

C. General Development Agreements

Ten provincial governments have entered into General Development Agreements with DREE. Under these the provinces may enter into Subsidiary Agreements which specify the objectives, means of implementation and cost-sharing arrangements of development programs. While most of the Subsidiary Agreements provide for general infrostructure

services some make provision for incentive grants and grant-like assistance to businesses.

Table II-2 in Chapter II, shows financial incentives programs under Subsidiary Agreements signed before March 31, 1979. Most of these Agreements provide for grants and forgivable loans towards the capital costs of modernization, expansion and the establishment of small businesses in designated rural areas. Some programs are designed to assist businesses whose projects because of size or type do not qualify for RDIA assistance. Moreover, as is shown in the Table, subsidizing agreements signed before 1979 by the provinces were to develop the tourist industry.

The underlying objective of all subsidizing agreements is to expand employment opportunities, usually in designated areas within a province where manufacturing, processing and tourist development is lagging. In table I-4 we present data on funding and estimated/expected man years created under six subsidiary agreements.

TABLE I-4

Funding Under Selected Subsidiary Agreements

Program	Date	Projects	Total Capital Cost $(000)	Incentive Grants $(000)	Estimated Man-Years Created
Manitoba, Small Enterprise Assistance	Dec/78 to March/80	100	5,360	2,088	380
New Brunswick Assistance to Small Business	March/74 to March/80	343	13,825	5,844	1,305
Tourism	March/76 to March/80	82	7,394	2,347	252

Since 1979 subsidiary agreements have been signed with some provinces to assist specific sectors or specific firms. For example, as already mentioned, under the Pulp and Paper Facilities Improvement Subsidiary Agreement with the Province of Ontario signed in May 1979, six grants amounting to $140 million had been approved by mid 1980 to firms for undertaking pollution abatement and modernization projects. The federal government shared fifty per cent of the required funding with the Province of Ontario. A similar agreement, was signed in May 1979 with the Province of Quebec, whereby the DREE contributes 60 per cent of grants approved for modernization of its pulp and paper industry. The total amount to be provided by the province and DREE is set at

$150 million.

In June 1980 the Province of Nova Scotia signed a subsidiary agreement for assistance to Michelin Tires (Canada) Ltd. The objectives of this agreement are to induce Michelin to make new capital investments of approximately $400 million and as a result employ the equivalent of an additional 1,850 persons and to increase significantly the value added in the Nova Scotian manufacturing sector. Of the $56 million to be provided to Michelin, $42 million is to be paid by DREE and the remainder by the Province of Nova Scotia.

FOOTNOTES

1. The Council has also encouraged the improvement of scientific and technological training by business with programs of salary subsidies.

2. The DIP Program is the major vehicle for supporting Canada's role under Defence Production Sharing Agreement and Defence Development Sharing Agreements negotiated with the United States and some European and Scandinavian countries.

3. Department of Industry, Program for Advancement of Industrial Technology, Ottawa, October 1, 1965.

4. These four programs were the Automotive Adjustment Assistance Program, the General Adjustment Assistance Program, the Footwear and Tanning Industry Adjustment Program and the Pharmaceutical Industry Development Assistance Program.

5. The Machinery Program implemented in 1968 is an alternative method for assisting industrial development. It provides for the remission of duty on certain imported machinery and related equipment above a minimum of $500 dutiable value. The program applies only to machinery and equipment not produced in Canada.

6. Regulations to the Act interpreted benefit to Canada as being satisfied when (a) the scientific research and development was carried on for the purpose of strengthening the business of the corporation or facilitating an

extension of such business, (b) the corporation is free to exploit the results of all such scientific research and development in Canada, and (c) the corporation is free to exploit the results of all such scientific research and development in all export markets.

7. The Automotive Adjustment Assistance Program (AAAA) and the Pharmaceutical Industry Development Assistance Program (PIDA) which provided assistance primarily in the form of loans, were terminated with the introduction of EDP.

8. The Department of Industry Trade and Commerce notes that total sales are understated because sales from successful projects need to be reported only after three years, because some successful companies withdraw applications or terminate agreements to avoid repayment and because in some cases sales need not be reported until the government's contribution has been repaid. See Department of Industry Trade and Commerce, Annual Review: Program For Export Market Development 1978/79.

9. The Agricultural and Rural Development Act (ARDA) and the Fund for Rural Economic Development (FRED) of 1965 provide some cash grants directly to businesses. Most of the activities formerly carried out under ARDA and FRED are not part of the General Development Agreement mechanism considered separately below.

10. Projects applied for between March and October 1977 received a 20 per cent grant.

11. The shipbuilding industry also benefits from the Fishing Vessel Construction Assistance Program administered by the Department of Fisheries and Oceans. Under this program funds are provided to owners or prospective owners of vessels in the inland or east coast fishery as an incentive for building and using modern small commercial fishing vessels in Canadian yards. The Government's contribution is up to 35 per cent of the cost of construction, modification or conversion of vessels.

12. Financial Times, May 19, 1980.

13. The grants were distributed as follows: Domtar Inc., $16 million; Abitibi-Price Corporation, $22.5 million; E.B. Eddy Forest Products Ltd., $25 million; Spruce Falls Power and Paper Co. Ltd., $7 million; Great Lakes Forest Products ltd., $38 million and Ontario Paper Co. Ltd., $32 million. These grants will support $1.2 billion in capital expenditure to be undertaken by these companies.

14. Under the programs for financing small manufacturing companies and firms in designated traditional sectors, loans are offered at market interest rates less one per cent.

CHAPTER II

THE DIMENSIONS OF GRANT EXPENDITURES

A. Estimate of Total Expenditures, Fiscal Year 1978-79

We estimate that in the fiscal year 1978-79 total federal and provincial direct grants and grant-like assistance to private sector industrial businesses (including those engaged in tourism but excluding those in fishing and agriculture) was of the order of $304 million. This total has been derived as follows:

	Millions of dollars	
Federal Government		
Major Grant Programs	228,410	
Share of GDAs	11,746	240,156
Provincial Governments		
Major Programs	57,600	
Share of GDA's	6,206	63,806
Total		303,962

B. Expenditures Under Major Federal Programs

Table II-1 shows the total amount of grant assistance provided under major federal programs. Over the decade, total assistance was of the order of $2.3 billion.[1] On a per annum basis, it increased somewhat up to 1976-77, when it reached a peak of $286.6 million, but declined significantly since then.

In fiscal year 1978-79, total grants under these programs had dropped to $228.4 million. In part, this decline is explained by the phasing out of the Industrial Research

TABLE II-1
GRANTS TO BUSINESS UNDER MAJOR FEDERAL PROGRAMS
CANADA 1969/70 - 1978/79

(Thousands of Dollars)

FISCAL YEAR	DIP	IRAP	COMMERCIAL AND FISHING SHIPBUILDING	RDIA*	IDAP	PEP	PAIT	EDP	IRDIA	PEMD	TOTAL
1969/70	48,499 (49,438)	6,295 (6,417)	14,215 (14,490)	54,515 (55,571)	----- -----	----- -----	5,290 (5,392)	------ ------	23,000 (23,445)	------ ------	151,814 (154,754)
1970/71	45,186	6,856	13,711	60,311	42	-----	13,055	------	30,114	------	169,275
1971/72	48,800 (46,743)	8,543 (8,183)	10,237 (9,806)	101,940 (97,644)	379 (363)	244 (234)	27,428 (26,272)	------ ------	31,278 (29,960)	414 (397)	229,263 (219,601)
1972/73	48,325 (41,624)	10,421 (8,976)	31,500 (27,132)	85,929 (74,013)	464 (400)	683 (588)	26,537 (22,857)	------ ------	31,963 (27,531)	2,738 (2,358)	238,560 (205,478)
1973/74	57,503 (41,578)	11,936 (8,631)	34,500 (24,946)	101,840 (73,637)	477 (345)	736 (532)	25,558 (18,480)	------ ------	30,416 (21,992)	2,859 (2,067)	265,825 (192,209)
1974/75	48,430 (31,509)	13,787 (8,970)	45,000 (29,278)	98,964 (64,388)	380 (247)	396 (258)	29,499 (19,193)	------ ------	26,549 (17,273)	3,287 (2,204)	266,392 (173,319)
1975/76	39,000 (24,133)	14,093 (8,721)	58,000 (35,891)	86,537 (53,550)	400 (248)	500 (309)	26,900 (16,646)	------ ------	33,018 (20,432)	4,245 (2,627)	262,693 (162,558)
1976/77	44,900 (25,760)	14,518 (8,329)	68,000 (39,013)	81,753 (46,904)	499 (286)	630 (361)	25,455 (14,604)	------ ------	45,922 (26,347)	4,963 (2,847)	286,640 (164,452)
1977/78	43,210 (22,694)	15,464 (8,122)	54,506 (28,630)	63,253 (33,221)	----- -----	----- -----	------- -------	34,022 (17,869)	16,438 (8,633)	5,700 (2,994)	232,693 (122,213)
1978/79	52,200 (24,167)	17,977 (8,323)	59,190 (27,403)	66,874 (30,960)	----- -----	----- -----	------- -------	23,201 (10,741)	153 (71)	8,815 (4,081)	228,410 (105,745)
TOTAL	475,053	119,890	388,959	801,916	2,641	3,189	179,722	57,223	268,851	33,121	2,331,565

SOURCE: Public Accounts

* Includes expenditures on programs replaced by RDIA.

Notes: 1) DIP - Defense Industry Productivity program; IRAP - Industrial Research Assistance Program; RDIA - Regional Development Incentives Act; IDAP - Industrial Design Assistance Program; PEP - Program to Enhance Productivity; PAIT - Program for the Advancement of Industrial Technology; EDP - Enterprise Development Program; IRDIA - Industrial Research and Development Incentives Act; PEMD - Program for Export Market Development.

2) The numbers in brackets are the amount of the grants deflated by the industry selling price index of manufacturing (1971 = 100).

and Development Assistance (IRDIA) program. The assistance provided under the Regional Development Incentives Act (RDIA) program also declined significantly in the last few years. Grants provided under the Enterprise Development Program (EDP) in 1977-78 exceeded substantially the total provided by the programs it replaced (ie. IDAP, PEP, and PAIT), but the amount provided dropped sharply in 1978-79. The Industrial Research Assistance Program (IRAP) and the Program for Export Market Development (PEMD) have both provided steadily, but moderately, increasing amounts of assistance. The yearly grants provided under the Defence Industry Productivity Program (DIPP) and,in the last few years, under the Commercial and Fishing Shipbuilding program have remained relatively steady.

In constant dollars (using industry selling price as the deflator) the total amount of grant expenditures (Table II-1 figures in brackets) has decreased in each year since 1971-72 and in 1978-79 was less than one half the amount provided in 1971-72 and only about two-thirds the amount provided in 1969-70. The decline in assistance as measured in constant dollars occurred under virtually all programs.

Part of the decline in assistance given under the federal programs, shown in Table II-1, has been offset by the emergence of the General Development Agreements (GDAs) and consequent grant programs administered jointly by the

TABLE II-2

FINANCIAL INCENTIVES TO BUSINESS COMMITTED UNDER SUBSIDIARY AGREEMENTS OF GENERAL DEVELOPMENT AGREEMENTS SIGNED BEFORE MARCH 31, 1979

(Millions of Dollars)

SUBSIDIARY AGREEMENT	PROVINCE	DATE SIGNED	EXPIRY DATE	AMOUNT OF INCENTIVE			TYPE OF INCENTIVE
				FEDERAL	PROVINCIAL	TOTAL	
Tourism Development	NFLD	22/02/78	31/03/83	3.06	0.34	3.40	Grants and Interest Rebates
Rural Development	NFLD	14/07/78	31/03/83	3.73	0.41	4.14	Grants
Tourism Development	N.S.	28/06/77	31/03/82	2.00	0.50	2.50	Grants, Interest Rebates
Industrial Development*	N.B.	17/02/75	31/03/80	2.00	0.20	2.20	Interest-Free Forgivable Loans
Kent Region Pilot Project*	N.B.	17/02/75	31/03/81	0.90	0.22	1.12	Interest-Free Forgivable Loans
Tourism Development*	N.B.	16/12/75	31/03/80	3.04	0.76	3.80	Interest-Free Forgivable Loans
NorthEast	N.B.	23/03/77	31/03/82	16.00	4.00	20.00	Interest-Free Forgivable Loans, and Grants
Industrial Development	MAN	21/04/78	31/03/83	3.00	2.00	5.00	Interest-Free Forgivable Loans
Tourism Development	MAN	15/12/78	31/03/84	4.20	2.80	7.00	
Qu'appelle Valley**	SASK	06/10/75	31/03/84	1.00	——	1.00	Grants
Nutritive Processing Assistance	ALTA	11/03/75	30/09/80	8.30	8.30	16.60	Grants
Industrial Development	BC	08/07/77	31/03/82	5.00	5.00	10.00	Interest-Free Forgivable Loans
Travel Industry Development	BC	17/10/78	17/10/83	6.50	6.50	13.00	Loans, Forgivable Loans
				56.73	31.03	89.76	

* Financial Assistance to Small Industry
**Recreation and Tourism

SOURCE: Department of Regional and Economic Expansion.

Department of Regional and Economic Expansion (DREE) and provincial governments. As explained in the previous chapter, subsidiary agreements signed under the GDAs contain programs that provide grants and grant-like assistance to businesses. Both the federal and provincial governments contribute to these programs. Table II-2 lists the subsidiary agreements signed before March 31, 1979, which includes such programs and shows the amount and type of assistance committed. It was not possible to ascertain the yearly breakdown of expenditures undertaken within these agreements but since, as it is shown, most agreements are in effect for five year periods, it is plausible that the flow of assistance would approach one fifth of the total of $89.8 million, that is, about $18 million per annum. This, to some extent, reflects a shift in emphasis in DREE's strategy away from RDIA assistance towards using GDAs as the main vehicle to promote regional economic development. In fact, it seems that GDAs will play an even greater role in providing business assistance in the future. As already noted in the previous chapter, several subsidiary agreements were signed after March 31, 1979, providing very substantial amounts in the form of grants to specific firms or industries, notably a grant of $56 million to Michelin in Nova Scotia and of grants totalling $150 million to the pulp and paper industry in each of the provinces of Ontario and Quebec in order to help this industry shoulder the cost of pollution control

expenditures.[2]

Table II-3 attempts to put the size of assistance given to businesses as grants under major federal programs into perspective by comparing it with some other relevant entities. These are gross national expenditure (GNE), federal government expenditures (which, of course, include the grants), transfers to persons, and investment in manufacturing. In all cases, the magnitude of the totality of the grants relative to that of other entities is small and declining. While the other variables were generally increasing, albeit at irregular and different rates, the total of the grants was declining in three of the last five years of the period. As a percentage of GNE, grants only constituted a maximum of 0.22 of 1 per cent and declined to 0.09 of 1 per cent in 1979. Grants to businesses did not constitute more than 1.2 per cent of federal government expenditures and the proportion was only 0.4 per cent in 1979. Grants were only a maximum of 3.7 per cent as large as transfers to persons and, in 1979, were only 1.6 per cent as large. Grants amounted to a maximum of 5.0 per cent of investment in the manufacturing sector and were down to 2.0 per cent in 1979. These latter figures should not be taken to mean that government grants financed from 2.0 to 5.0 per cent of manufacturing investment since some of the grants went to primary producers and to businesses in the tertiary sector. Moreover, a large portion of the

TABLE II-3

GRANTS TO BUSINESS IN PERSPECTIVE

YEAR	GRANTS ($000)	% CHANGE	GROSS NATIONAL EXPENDITURE ($000,000)	% CHANGE	GRANTS AS A % OF GNE	FEDERAL GOVERNMENT EXPENDITURES ($000,000)	% CHANGE	GRANTS AS A % OF FED. GOVT. EXP.	TRANSFERS TO PERSONS ($000,000)	% CHANGE	GRANTS AS A % OF TRANSFERS TO PERSONS	INVESTMENT IN MANUFACTURING ($000,000)	% CHANGE	GRANTS AS A % OF I IN MANUFACTURING
1970	151,514	------	85,685	------	0.18	15,262	------	1.0	4,057	------	3.7	4,648	------	3.2
1971	169,275	11.5	94,450	10.2	0.18	17,386	14.0	1.0	4,684	15.5	3.6	4,477	2.7	3.8
1972	229,263	35.4	105,234	11.4	0.22	20,126	15.6	1.2	6,186	32.0	3.7	4,605	2.8	5.0
1973	238,560	4.1	123,560	17.4	0.19	22,422	11.3	1.1	7,008	13.3	3.4	5,587	21.3	4.3
1974	265,825	11.4	147,528	19.4	0.18	28,869	28.5	0.9	8,705	24.2	3.0	7,260	29.2	3.7
1975	266,392	0.2	165,343	12.1	0.16	35,509	23.3	0.8	10,620	22.0	2.5	7,967	9.7	3.3
1976	262,693	-1.4	191,166	15.6	0.14	38,793	9.5	0.7	11,533	8.6	2.3	8,357	4.9	3.1
1977	286,640	9.1	209,379	9.5	0.14	43,839	13.4	0.7	13,089	13.5	2.2	9,297	11.2	3.1
1978	232,693	-18.8	230,407	10.0	0.10	49,001	11.7	0.5	14,616	11.7	1.6	9,774	5.1	2.4
1979	228,410	-1.8	260,533	13.1	0.09	52,438	7.0	0.4	14,699	0.6	1.6	11,215	14.7	2.0

SOURCES: Public Accounts; Department of Finance; Economic Review, 1980.

NOTES: All values in current dollars. Amount of grants at ends of fiscal year (March 31).
Government expenditures on National Income Accounting Basis.

grants financed research and development projects rather than capital expenditures.

Table II-4 shows the provincial repartition of the amount, number, and percentage of grants provided under major federal programs in 1978-79. Quebec and Ontario businesses obtained by far the largest shares of the grants. Businesses in these two provinces obtained about 78 per cent of the total grants provided in 1978-79. As Table II-5 shows, a similar pattern occurred in other years. In fact, this is not surprising since grants to industry will go where the industry is located. As shown in the last column of Table II-5, Ontario and Quebec accounted for 76.6 per cent of the value of manufacturing shipments. Within these two provinces, however, the percentage of grants provided and the relative size of their manufacturing sectors were almost reversed. This is because Quebec obtained a far larger share of the grants under the two largest programs, the RDIA program and the programs that assist the shipbuilding industry. Overall, then, the totality of the grant programs does nothing to alter the regional industrial balance. Of course, with the exception of the RDIA program, that is not one of their explicitly stated aims. The pattern of RDIA expenditures was different and was indeed directed towards the lower income provinces, irrespective of their industrial structure.

TABLE II-4

PROVINCIAL REPARTITION OF MAJOR FEDERAL GRANTS EXPENDITURES FOR 1978/1979 - ($000)

VINCE	DIP			IRAP			SHIPBUILDING			RDIA			EDP			PEMD			TOTAL			SHARES OF VALUE OF MANUFACTURING SHIPMENTS
	AMT	(NO)	%	AMT	(NO)	%	AMT	(NO)	%	AMT	(NO)	%	AMT	(NO)	%	AMT	(NO)	%	AMT	(NO)	%	
D	------	----	-----	34	(2)	0.2	------	----	-----	3,719	(12)	5.71	75	(3)	0.33	44	(1)	0.95	3,873	(18)	1.77	0.6
	------	----	-----	34	(1)	0.2	------	----	-----	1,223	(28)	1.88	104	(3)	0.46	-----	----	-----	1,367	(32)	00.62	0.6
	38	(1)	0.07	488	(5)	2.76	1,417	(2)	2.48	4,777	(64)	7.34	16	(1)	0.07	54	(1)	1.16	6,790	(75)	3.10	2.0
	------	----	-----	------	-----	-----	8,848	(1)	15.50	3,230	(51)	4.96	49	(3)	0.22	-----	-----	-----	12,127	(55)	5.55	1.9
	24,479	(22)	46.93	3,892	(41)	21.92	30,897	(4)	54.13	32,250	(264)	49.56	6,946	(55)	30.91	2,316	(49)	49.86	100,772	(435)	46.08	26.3
	27,332	(40)	52.40	10,676	(105)	60.28	10,673	(3)	18.70	6,650	(70)	10.22	12,513	(113)	55.69	1,505	(41)	32.40	69,349	(372)	31.72	50.3
	------	----	-----	161	(2)	0.91	------	----	-----	6,227	(89)	9.57	181	(8)	0.81	55	(3)	1.18	6,625	(102)	3.03	2.7
K	------	----	-----	342	(7)	1.93	------	----	-----	3,184	(35)	4.89	117	(3)	0.52	-----	----	-----	3,643	(45)	1.67	1.2
A	191	(2)	0.37	731	(12)	4.13	------	----	-----	1,609	(8)	2.47	580	(17)	2.58	210	(6)	4.52	3,321	(45)	1.52	5.5
	117	(3)	0.23	1,362	(15)	7.67	5,247	(9)	9.18	2,137	(9)	3.28	1,888	(24)	8.41	459	(10)	9.93	10,752	(70)	4.92	9.2
	------	----	-----	------	-----	-----	------	----	-----	71	(2)	0.12	------	----	-----	-----	-----	-----	71	(2)	0.03	0.0
ON	------	----	-----	------	-----	-----	------	----	-----	------	-----	-----	------	-----	-----	-----	-----	-----	-------	------	------	----
TOTAL	52,157	(69)	-----	17,710	(190)	-----	57,082	(19)	-----	65,077	(632)	-----	22,470	(230)	-----	4,645	(111)	-----	218,682	(1251)	-----	----
AL	32,200			17,977			59,190			66,874			23,209			8,815			228,410			99.7

RCES: Public Accounts, Volume II, 1979. Department of Finance, Economic Review, 1980. Table 6.3.

TABLE II-5

PROVINCIAL REPARTITION OF GRANTS

VINCE	DIP* (1959-1979) ($000,000)	IRAP* (1962-1979) ($000,000)	SHIPBLDG* (1974-1979) ($000,000)	RDIA* (1969-1979) ($000,000)	IDAP* (1971-1975) ($000)	PEP* (1971-1979) ($000)	PAIT* (1970-1975) ($000)	EDP** (1977-1979) ($000)	IRDIA* (1970-1973) ($000)
D	-----	0.2	10.1	16.9	-----	-----	-----	323	2.0
	-----	(0.1)	(3.5)	(2.7)	-----	-----	-----	(0.6)	(0.0)
	-----	0.3	0.1	10.7	-----	-----	47.2	262	23.5
	-----	(0.2)	(0.0)	(1.7)	-----	-----	(0.0)	(0.5)	(0.0)
	5.0	2.7	26.7	61.3	-----	28.6	237.8	105	566.9
	(0.8)	(1.7)	(9.4)	(9.8)	-----	(1.0)	(0.2)	(0.2)	(0.6)
	4.8	0.2	46.4	61.1	63.8	65.1	112.0	523	289.1
	(0.7)	(0.1)	(16.3)	(9.8)	(2.3)	(2.2)	(0.1)	(0.9)	(0.3)
	309.7	46.1	115.1	272.9	645.7	996.7	24,527.5	7,909	27,285.8
	(47.4)	(28.4)	(40.4)	(43.9)	(23.5)	(34.1)	(19.3)	(13.7)	(26.3)
	318.8	91.7	43.1	67.6	1,664.0	1,337.3	80,867.0	33,832	61,695.0
	(48.8)	(56.5)	(15.1)	(10.8)	(60.4)	(45.8)	(63.5)	(58.7)	(59.5)
	7.7	1.5	0.2	58.5	223.4	146.6	1,300.2	1,529	1,143.6
	(1.2)	(0.9)	(0.0)	(9.4)	(8.1)	(5.0)	(1.0)	(2.7)	(1.1)
K	-----	1.8	-----	21.0	-----	52.9	457.0	675	363.5
	-----	(1.1)	-----	(3.4)	-----	(1.8)	(0.4)	(1.2)	(0.4)
A	5.0	6.3	0.5	30.5	21.7	55.7	4,096.1	2,375	7,847.4
	(0.8)	(3.9)	(0.2)	(4.9)	(0.8)	(1.9)	(3.2)	(4.1)	(7.0)
	2.1	11.6	42.6	7.6	134.2	239.3	15,721.1	10,056	4,418.2
	(0.3)	(7.1)	(15.0)	(1.2)	(4.9)	(8.2)	(12.3)	(17.5)	(4.3)
ADA	653.0	162.4	284.8	607.2	2,752.8	2,922.2	127,365.9	57,589	103,645.3
	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

NOTES: * represents expenditures; ** represents commitments. Figures in brackets represent percentages.

SOURCES: Various, including some private communications. The breakdown of the data for some programs is incomplete because such data was not made available to us. This limitation applies also to Tables II-7 and II-8 below.

Provincial governments have their own programs of assistance to businesses. However, at least with respect to the provision of this assistance in the form of grants, most of the effort consist in the participation by the province in the GDAs with the federal government. As shown in Table I-1 of the previous chapter, non-GDA provision of grants, while not negligible, is small. And the provincial share of the grants provided under GDA Subsidiary Agreements, as shown in Table II-2, amount to only about $31 million for a period stretching (albeit in an overlapping manner) from 1975 to 1984. In general, provinces seem to prefer to provide incentives through a varied assortment of loans, loan guarantees, equity participation, and tax credits, rather than grants.

The province of Quebec seems to be the exception to this rule. Quebec has sought to rationalize its assistance to business, using a wide array of instruments to do so. In 1971, the Société de développement industriel du Québec (SDIQ), created under the Quebec Industrial Assistance Act of 1971, took over almost all of the programs of assistance to industry in the province. SDIQ discontinued existing programs and implemented its own, under the authority of the Minister of Industry and Commerce. In 1979, the Act was amended so as to give SDIQ authority to provide certain forms of assistance without ministerial approval. However, assistance given by SDIQ in the form of subsidies or debt

forgiveness must still be approved by the Minister of Industry and Commerce and the cost is paid by the Minister of Finance. Three of the six programs administered by SDI provide subsidies in the form of interest rebates on loans.[3] Table I-3 in the previous chapter shows the number of projects and the amounts of subsidies provided by SDI in various years and over the period of its existence. As of March 31, 1980, SDI had granted $339.9 million of such subsidies. A total of 1532 projects had benefitted from such assistance.

Of what magnitude were individual grants? Table II-6 shows the distribution of grants by size under several major federal programs in the year 1978-79. An arbitrary distinction was made between grants of less than $120,000 and those over that sum. If the former be considered "small" and the latter be considered "large" grants, it is clear that a large proportion of the grants provided are small. Only 19 per cent of the grants provided under the four programs considered were $120,000 and over. Only DIP provided a majority (59 per cent) of "large" grants. And even in the case of DIP, only 16 grants (or 24 per cent) were grants of $500,000 or more. In terms of the amounts provided, however, grants of $120,000 and over absorbed large proportions of the funds disbursed under all four programs. In the case of DIP, 97 per cent of grants were of this category.

TABLE II-6

DISTRIBUTION OF GRANTS BY SIZE – 1978/79

SIZE OF GRANTS ($000)	NUMBER OF GRANTS				
	EDP	IRAP	DIP	RDIA	TOTAL
0 - 39.9	136	58	8	390	592
40 - 79.9	57	54	11	141	263
80 - 119.9	8	30	8	52	98
120 - 159.9	4	25	6	22	57
160 - 219.9	6	10	4	31	51
220 - 299.9	6	8	7	14	35
300 - 499.9	6	6	6	20	38
500 - 599.9	2	1	2	5	10
600 - 699.9	2	-	1	2	5
700 - 799.9	1	-	-	-	1
800 - 999.9	-	-	3	4	7
1000 - 1299.9	-	-	2	1	3
1300 - 1699.9	-	-	1	1	2
1700 - 2999.9	1	-	4	2	7
3000 - 3999.9	-	-	-	-	-
4000 - 4999.9	1	-	-	2	-
5000 - 6999.9	-	-	-	-	-
7000 - 7999.9	-	-	1	-	1
8000 - 10999.9	-	-	1	-	1
11000 - 12000.0	-	-	1	-	1
TOTAL	230	192	66	687	1175
NUMBER OF GRANTS $120000 AND OVER	29	50	39	104	222
PERCENTAGE OF GRANTS $120000 AND OVER	13	26	59	15	19
TOTAL AMOUNT OF GRANTS ($000)	23,200	17,977	52,200	66,874	160,251
TOTAL AMOUNT OF GRANTS $120,000 AND OVER ($000)	15,414	10,247	50,477	42,386	118,524
PERCENTAGE AMOUNT OF GRANTS $120,000 AND OVER	66	57	97	63	74

SOURCE: Public Accounts.

NOTE: The figures denote actual amounts paid.

TABLE II-7

DISTRIBUTION OF GRANTS SIZE -- SELECTED PROGRAMS

PEMD* (1971-1979)

SIZE ($)	NUMBER	PERCENTAGE		
UNDER 10,000	426	5.5		
1001 - 3000	3051	39.3		
3001 - 5000	1694	21.8		
5001 - 10,000	1347	17.4		
10,001 - 20,000	745	9.6		
20,001 - 40,000	319	4.1	N.A.	N.A.
40,001 - 70,000	106	1.4		
70,001 -100,000	32	0.4		
OVER 100,000	38	0.5		
TOTAL	7758	100		

IRDIA (1967-1975)

SIZE ($)	NUMBER	PERCENTAGE		
UNDER 5,000	3265	39.4		
5001 - 10,000	1604	19.4		
10,001 - 50,000	2574	31.0		
50,001 - 100,000	392	4.7	N.A.	N.A.
100,001 - 1,000,000	415	5.0		
OVER 1,000,000	38	0.5		
TOTAL	8288	100.0		

PAIT (1970-1975)

SIZE ($)	NUMBER	PERCENTAGE	AMOUNT ($000)	PERCENTAGE
20,000 OR LESS	677	41.0	6223.5	4.9
20,001 - 50,000	437	26.5	14292.5	11.2
50,001 - 100,000	275	16.6	19615.5	15.4
100,001 - 500,000	231	14.0	43702.1	34.3
500,000 - 6,000,000	32	1.9	43532.4	34.2
TOTAL	1652	100.0	127366.0	100.0

TABLE II-7 (cont'd)

DIP (1970-1975)

SIZE ($)	NUMBER	PERCENTAGE	AMOUNT ($000)	PERCENTAGE
50,000 OR LESS	433	45.5	7,985.9	2.7
50,001 - 100,000	164	17.2	12,029.4	4.1
100,001 - 500,000	258	27.1	54,148.3	18.2
500,001 - 1,000,000	43	4.5	30,795.1	10.4
1,000,001 - 25,000,000	54	5.7	191,916.7	64.6
TOTAL	952	100.0	296,875.5	100.0

SIAP (1970-1975)

SIZE ($)	NUMBER	PERCENTAGE	AMOUNT ($000)	PERCENTAGE
1,000 - 20,000	29	5.6	369.6	0.2
20,001 - 100,000	248	48.1	14,027.3	9.4
100,001 - 400,000	162	31.4	33,274.8	22.3
400,001 - 1,000,000	48	9.3	29,967.4	20.1
OVER 1,000,000	29	5.6	71,524.0	48.0
TOTAL	516	100.0	149,163.1	100.0

IBDLA (1970-1973)

SIZE ($)	NUMBER	PERCENTAGE	AMOUNT ($000)	PERCENTAGE
5,000 OR LESS	1723	44.3	2,906.1	2.8
5,001 - 10,000	742	19.1	5,342.2	5.2
10,001 - 50,000	1073	27.6	22,489.9	21.7
50,001 - 100,000	179	4.6	12,413.3	12.0
100,001 - 1,000,000	161	4.1	39,527.3	38.1
OVER 1,000,000	13	0.3	20,966.6	20.2
TOTAL	3891	100.0	103,645.3	100.0

*Based on number of applications approved.

SOURCE: Various. See also note to Table II-5.

This pattern (ie. a large number of small grants absorbing only a small proportion of the funds while a small number of large grants absorbs a large portion of the funds) is substantiated by the figures in Table II-7. This table shows the distribution of grants size for selected programs for a variety of periods. The inverse relationship between the number of grants and the amount of the funds absorbed holds for all programs. In a sense, this is inevitable since the funds granted under each program are not very great. Therefore, any single large grant is bound to constitute a significant share of the total.

Which industries were the largest recipients of federal grants? While it was not possible to obtain a complete and detailed account, Table II-8 shows the distribution of grants by industry sectors over a disparate number of periods for various federal programs. The heaviest recipient sectors were: the consumer products and textiles sector (20.1 per cent), attributable largely to the contribution of the RDIA program; the transportation (21.5 per cent) and the electrical and electronics (18.1 per cent), which obtained sizable shares of expenditures under the largest programs, except RDIA; and the resource and construction industries (17.6 per cent) which absorbed, inter alia, more than a quarter of RDIA expenditures.[4]

It is evident that research-oriented programs, such as IRAP and IRDIA, directed a large share of expenditures

TABLE II-8

GRANTS EXPENDITURES BY SECTOR

(Amounts in $000)

INDUSTRY SECTOR	DIP (1970-75)	IRAP (1970-75)	RDIA (1969-79)	IDAP (1971-75)	PEP (197_-75)	PAIT (1970-75)	IRDIA (1970-75)	PEMD (1972-75)	PPP (1974-75)	TOTAL
griculture ish and Food	----- -----	5,050.9 (8.7)	84,857 (14.0)	----- -----	393.2 (13.5)	2,589.2 (2.0)	4,964.2 (4.8)	332.1 (4.4)	283.7 (5.7)	98,472.4 (8.1)
nsumer Product d Textile	1,030.6 (0.3)	10,343.9 (17.9)	225,808 (37.3)	674.6 (24.5)	930.2 (31.8)	1,643.6 (1.3)	1,252.8 (1.2)	270.8 (3.7)	1,241.6 (24.9)	243,186.2 (20.1)
chinery	4,285.0 (1.4)	3,259.0 (5.6)	23,673 (3.9)	700.3 (25.4)	322.1 (11.4)	15,604.2 (12.2)	2,837.2 (2.7)	2,125.8 (29.0)	672.4 (13.5)	53,489.0 (4.4)
ansportation*	195,513.0 (65.9)	1,200.0 (2.1)	27,799 (4.6)	553.6 (20.1)	125.2 (4.3)	23,576.9 (18.5)	9,838.5 (9.5)	880.6 (12.0)	1,253.4 (25.1)	260,740.4 (21.5)
ectrical* Electronics	95,965.8 (32.5)	11,013.0 (19.0)	21,672 (3.6)	567.1 (21.7)	312.5 (10.7)	53,185.5 (41.8)	34,653.3 (33.4)	1,367.1 (19.1)	718.2 (14.4)	219,514.8 (18.1)
emical	577.4 (0.2)	12,172.4 (21.0)	28,897 (4.8)	104.2 (3.8)	139.1 (4.8)	9,589.8 (7.5)	21,272.7 (20.5)	269.5 (3.7)	15.6 (0.3)	73,038.5 (6.0)
source Industry Construction	503.6 (0.2)	10,974.6 (19.0)	156,153 (25.7)	122.9 (4.5)	687.5 (23.5)	21,176.7 (16.6)	21,949.3 (21.2)	661.1 (9.0)	380.6 (7.6)	212,609.3 (17.6)
her	----- -----	3,833.2 (6.6)	38,314 (6.3)	----- -----	----- -----	----- -----	6,876.2 (6.6)	----- -----	----- -----	49,023.4 (4.0)
ecial Projects	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	1,396.5 (19.1)	427.1 (8.6)	1,823.6 (0.1)
tal	295,875.5 (100)	57,847.0 (100)	607,173 (100)	2,752.7 (100)	2,922.2 (100)	127,365.9 (100)	103,645.3 (100)	7,323.2 (100)	4,992.7 (100)	1,210,902.5 (100)

RCES: Various. See also note to table II-5.

ES: Figures in brackets are percentages.
* Includes the aerospace industry.

towards the electrical and electronics, chemical and resource and construction industries. A total of 59.0 per cent of IRAP's and of 75.1 per cent of IRDIA's expenditures went to those sectors. Product development type of programs, such as DIP, PAIT, and PEMD, tended to favour the electrical/electronics and transportation industries. These two industries absorbed the expenditures of these three programs as follows: DIP (98.7 per cent), PAIT (60.3 per cent), PEMD (31.1 per cent).[5] Combined, the R&D-oriented programs seem to direct the money towards industries where significant advances in technology and, consequently, in productivity, are likely. This pattern, then, conveys an element of industrial strategy. The RDIA pattern of expenditures, instead, reflects the objectives of that program. A total of 81.0 per cent of expenditures went to agriculture, consumer products and textiles, and the resources and construction industries. This is explainable in that the low income areas of the country, where expenditures are directed, are either producers of primary commodities or the hosts of light industry, such as textiles.

An interesting question, in view of the stated objectives of grants programs, is the size of the companies which obtained the grants. It is plausible that companies of a given size are in a better position to fulfil the objectives of grants programs designed to improve economic performance. Similarly, firms of a certain size may be in

greater need than others for the assistance provided under programs designed to help companies overcome specific difficulties. For instance, in the case of grants given to help companies adjust to new market conditions, one presumes that small companies, given their smaller financial resources, will stand in greater need of such assistance than large ones. Similarly, one may expect that larger companies are in a better position to assume the risks entailed by specific projects than smaller ones since they can make up the losses from failed projects with the profits from the successful ones. So larger firms would stand in less need of sharing risks with governments by having the latter finance part of the projects by means of grants. On the other hand, enhancement of productivity may be more easily obtainable if projects are undertaken by companies which can take advantage of economies of scale and, presumably, these are larger companies.

It would have been desirable, therefore, to obtain detailed and comprehensive data showing the distribution of grants under each program by company size. Unfortunately, we were able to obtain only rather sketchy data for a few programs. And even for these it was difficult to define unambiguously what is a small company and what is a large one. In order to obtain some evidence we arbitrarily defined as "large" a company that fulfilled one or more of the following characteristics: (a) its annual sales would

TABLE II-9

GRANTS TO "LARGE" COMPANIES

	1977/78	
PROGRAM	AMOUNT	PERCENTAGE
EDP	18988	78.6
DIP	31292	74.9
RDIA	18868	46.6

	1978/79	
EDP	14250	92.5
DIP	29222	57.5
RDIA	123.3	29.5

SOURCE: Compiled from The Canadian Key Business Directory and Public Accounts.

TABLE II-10

DISTRIBUTION OF IRAP GRANTS BY COMPANY SIZE

(1967/70 - 1978/79)

	GRANTS ($000)	PERCENTAGE
SMALL (1 - 199 EMPLOYEES)	46,096.3	38.5
MEDIUM (200 - 999 EMPLOYEES)	19,430.4	16.2
LARGE (OVER 2000 EMPLOYEES)	48,917.3	40.8
ASSOCIATIONS	5375 .6	4.5
TOTAL	119,819.6	100.0

SOURCE: Communication by the Department of Industry, Trade, and Commerce.

be $5 million or more; (b) it would employ 100 or more workers; (c) its net worth would be $500,000 or more. Using this definition, Table II-9 shows the amounts and percentages of grants provided by three federal programs in fiscal years 1977-78 and 1978-79 to these "large" companies. Table II-10, using a different definition of size, shows the breakdown of grants by company size for the decade 1969-70 to 1978-79 under the IRAP program.

Clearly, this data does not show a uniform pattern. The share of assistance flowing to firms of one size or another varies considerably from program to program and, for the same program, from year to year. The large percentage of EDP grants allotted to large companies is somewhat surprising in light of the requirement that grants will be provided only for projects which represent a "significant burden" on recipient firms and of the fact that, as shown in Table II-6 , only a small proportion of the grants exceeded $120,000. It is not surprising, on the other hand, that the proportion of grants provided to large companies under the RDIA program is rather small, given the type of industries mainly supported by this program.

FOOTNOTES

1. Table I shows expenditures made under programs whose explicitly stated purpose is to provide assistance to business in order to attain the objectives outlined above. In fact, some grants are provided to business for other purposes, such as for training industrial workers and under other employment-creating and price-support programs.

2. Some additional grants are provided through other joint DREE - provincial programs, such as the Agricultural and Rural Development Act (ARDA) program in Newfoundland. But the total amounts involved are not great.

3. The three programs are: Assistance financière aux entreprises manufacturières à technologie moderne (Program A); Assistance financière au regroupement des entreprises manufacturires (Program B); Assistance financière à l'exportation (Program D). These and other programs also provide one or more of the following: loans, loan guarantees and equity participation.

4. The effects of RDIA expenditures on the sectoral distribution of grants are magnified in Table VI, because, not only is RDIA the largest single program on a yearly basis, but the total amount accounted for under this program is for a greater number of years.

5. A sizeable share of the grants to these industries under DIP can be accounted for by a relatively few large grants to aerospace firms.

CHAPTER III

A MODEL OF PUBLIC AID TO PRIVATE ENTERPRISE

A. Introduction: Loans and Grants

In this chapter we construct a simple choice model for firms and government aid agencies to illuminate the role of the most obvious economic variables concerned. The earlier sections of this study have discussed a wide range of determinants of public policy as well as results of aid programs. In this section we reduce the reasons for government aid to the desire to underwrite risk and the desire to provide social benefits. We assume that the government is willing to make loans and/or grants to provide for these social objectives.

Regardless of the present value of the desired social objective we construct an expected loss function for the government loan and the expected benefit function for the recipient of the loan. By fixing the expected loss of the loan to the expected value of the desired social objective we can obtain the various combinations of loan sizes and government interest rates which maintain a fixed expected loss. The principle is, of course, that the government would be willing to internalize the social benefits, that is, the government need not provide financial assistance equal to the full value of social benefits if the recipient firm is induced to internalize some portion of the social benefits as a result of governments actions. The alternative to the government loan is a government grant in which the grant size would also be fixed at a value equal to the expected social benefits.

The firm computes the expected gain (subsidy) from a government loan as the present value of the difference between the annuities (payments of principal and interest) of a loan at market rates and a loan at a lower government rate. On the other hand, the value of a grant to a firm is equal to the face value of the grant.

B. The Model

1. The Government Objective Function

Let us first introduce the following notation. The value of an annuity, A, for loan, L, at rate, r, with maturity, n, is given by

$$(1) \qquad L = A \sum_{i=1}^{n} 1/(1+r)^i$$

or

$$(2) \qquad A = \frac{L}{\sum_{i=1}^{n} 1/(1+r)^i}$$

Let

$$\sum_{i=1}^{n} \frac{1}{(1+r)^i} = \hat{r}$$

and note that

$$\frac{\partial \hat{r}}{\partial r} < 0 \quad \text{and} \quad \frac{\partial \hat{r}^{-1}}{\partial r} > 0$$

We also define

$$(3) \qquad \frac{\partial(\hat{r}^{-1})}{\partial r} = (\partial \hat{r}) > 0$$

$$\frac{\partial(\hat{r}_q^{-1})}{\partial r_q} = (\partial \hat{q}) > 0$$

$$\frac{\partial(\hat{r}_m^{-1})}{\partial r_m} = (\partial \hat{m}) > 0$$

where r_g, r, and r_m are to be identified presently.

We define the expected loss of a loan made by the government to be the face value of the loan less the expected value of the annuities paid up but discounted at a "social rate" of discount r. Thus loan L is made with a maturity of n years at a rate of r_q to a firm. The probability that a firm will fail to make a payment in any period is p_i . This loss function is written as

$$(4) \qquad E(L) = L - \sum_{i=1}^{n} (1-p_i) \frac{L}{\hat{r}_q} \frac{1}{(1+r)^i}$$

We assume that there are many similar projects being funded in any given period so that we can allow the probability of failure to be equal in each period. Thus

$$(5) \qquad E(L) = L \left[1-(1-p) \frac{\hat{r}}{\hat{r}_g}\right]$$

The combination of r_g and L (for given r, n, p) which could be used to give a fixed loss can be found by totally differentiating (5) by L and r_g and setting dE(L) equal to zero.

$$(6) \qquad \frac{dL}{dr_g} = \frac{(1-p)\, L\, \hat{r}\, (\partial \hat{g})}{1-(1-p)\, \hat{r}/\hat{r}_g}$$

$$\lesseqgtr 0 \text{ as } (1-p)\, \hat{r} \gtreqless \hat{r}_g$$

undefined for $(1-p)\, \hat{r} = \hat{r}_g$

The interpretation is straightforward. First note that the iso-loss function is undefined for $(1-p)\, \hat{r} = \hat{r}_g$ or equivalently, when $\hat{r} - \hat{r}_g = p\hat{r}_g$. But the terms with 'hats' are capitalization factors which are inversely related to the interest rate from which they are defined. . The term $(-p\hat{r})$ can be interpreted as the risk premium defined in terms of the social discount rate. It must be the case that $r < r_g$ for $\hat{r} - \hat{r}_g > 0$ with the difference in rates being the risk premium. Let us denote the risk premium as r', then if $r_g^* = r + r'$, there are no expected losses; the expected rate of return is r, which is also the social discount rate. If $r_g > r + r'$ then gains can be made (negative losses), and conversely when $r_g < r + r'$ losses are incurred. Figure 1 illustrates an iso-loss curve for the government.

To discuss the interesting implications of the model, we must make explicit the underlying definition of the riskless rate of social discount. In the absence of taxes, the social rate of

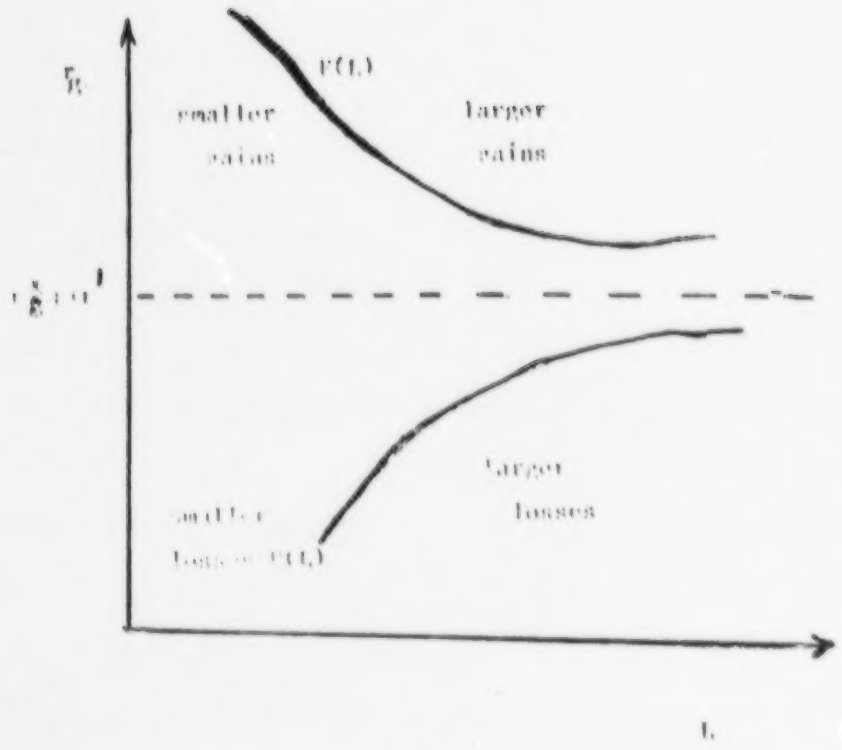


Figure 1

Isoloss curve: expected value of loan loss annuities paid, losses (gains) increase with either larger loans or lower rates charged. No losses if loan rate is the social rate adjusted for risk.

discount is that rate for which the public in the form of the government can borrow on financial markets. This rate is independent of economic externalities of government investment projects. If government borrowing is viewed by the market as the least risky form of debt then the long term government borrowing rate is (here) called the riskless social rate of discount. We assume that the government can take advantage of risk spreading and risk-pooling at least as much as any other financial agent and that government debt is therefore the minimum risk debt. We will refer to this as "the riskless" rate.

The analysis above suggests that projects with no external social benefits could be financed by the government at rate, r_g^*, equal to the social rate plus a risk premium. The opportunity cost is the social rate of discount and the rate of return is the loan rate less the risk premium or

(7) $$r = r_g^* - r'$$

When economic externalities exist then

(8) $$r = r_g^* - r' + S.B.$$

where S.B. is the value of the external social benefits (transformed into an appropriate rate). Whenever external social benefits do exist, the loan rate can be reduced. Indeed any loan rate could be viewed as an appropriate scaling of the external social benefits.

2. The Firm's Objective Function

The firm computes the value of a loan at government rates as the savings in interest costs over the period of repayment. The risk of the firm's bankruptcy is considered only to the extent that the market rate for the firm includes a risk premium. The recipient firm assumes that it will succeed, however, else it would not commence the venture.[1] The firm's gain is written as:

$$(9) \qquad F(\text{Gain}) = \left(\frac{L}{\hat{r}_m} - \frac{L}{\hat{r}_g}\right) \sum_i 1/(1+r_m)^i = L\left(1 - \frac{\hat{r}_m}{\hat{r}_g}\right)$$

where $L/\hat{r}_m$ is the annuity of a loan L at rate r_m , the market rate. Differentiation of (9) with respect to L and r_g and setting dF(Gain) equal to zero we derive the slope of the iso-gain curve of the firm.

$$(10) \qquad \frac{dL}{dr_g} = Lr_m \,(\partial\hat{g})/\left(1 - \frac{\hat{r}_m}{\hat{r}_g}\right) \quad 0$$

(note that $r_g < r_m$ for the firm to consider r_g as favourable thus $\hat{r}_m/\hat{r}_g < 1$). Clearly, the expected gain to the firm increases as the size of the loan increases or as the rate of interest charged decreases. Figure 2 illustrates the firm's iso-gain curve. (There may be further benefits to firms than those discussed here. To the extent that creditors view government funding as securities, market rates may be lowered to the firm overall.)

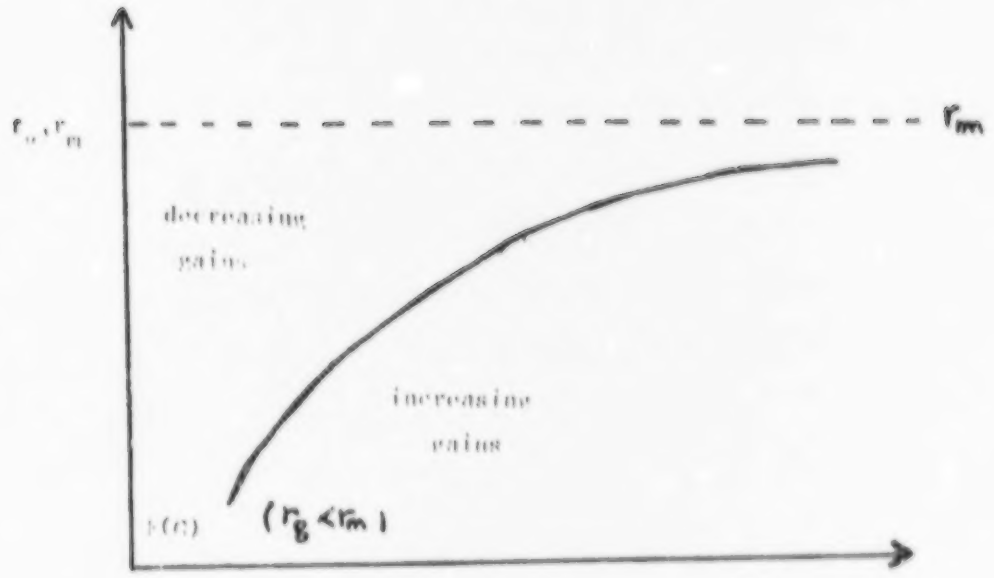


Figure 9

Firm's investment curve for some $r_B < r_m$.
No gain for $r_m = r_B$.

3. A Market for Loans and Grants

We wish to be very explicit in this simple model and therefore make the following assumptions.

Assumption 1. The firm is a profit maximizer and seeks to maximize the gain it can get from government aid. It considers the financing required for a given project or venture and looks for the maximum aid possible as a first step in financing. This assumption is not necessarily a poor representation of the real world in many cases as has been reported by Ernst and Whinney (1980, 17 and 21).[2]

Assumption 2. The firm knows the amount of capital grant that it would be eligible to receive.[3] Again this assumption is realistic in many cases since grant programs often define eligibility in terms of new capital expenditure and new full time jobs created.

Assumption 3. The firm is indifferent between a loan with an implicit gain and an equivalent grant.

Assumption 4. The government does make an estimate of the social benefits of projects for which financial assistance is requested. This assumption, though of crucial importance, is not necessarily consistent with assumption 2.

Assumption 5. The government is indifferent between giving a loan or a grant if the expected loss of the loan equals the size of the grant.

Assumption 6. The government is willing to provide aid to business to the extent that the net social benefits of so doing are

non-negative. That is, the government is willing to pay for social benefits if the cost is less than or equal to the social benefits. (Some of the cost of the social benefits may be internalized by the firm which undertakes the project.)

Given these assumptions, we suppose that the government is willing to make a grant $\bar{G}$ to a specific venture which equals the social benefits (however calculated) of the venture. The firm also knows about the possible $\bar{G}$. However, since the government is willing to make a loan with an expected loss of $\bar{G}$ to secure the equivalent social benefits, the firm has the option of demanding either subsidy since to the firm the implicit gain in a loan must be equal to the expected loss to the government. We thus maximize isoprofit and isoloss curves.

(7) $\quad \dot{r}(L) = L - (1-p)\, L \dfrac{\dot{r}}{\dot{r}_g}$

(9) $\quad \dot{r}(G) = L - L \dfrac{\dot{r}_m}{\dot{r}_g}$

If we set $\dot{r}(L)$ equal to $\dot{r}(G)$ then

(11) $\quad L - (1-p)\, L \dfrac{\dot{r}}{\dot{r}_g} = L - L \dfrac{\dot{r}_m}{\dot{r}_g}$

Thus, by elimination of L and $\dot{r}_g$

(12) $\quad \dot{r}_m = \dot{r} - \dot{r}p$

When the expected loss to the government equals the gain to the firm then $r_m = r + \varepsilon'$. Indeed when $r_m = r + \varepsilon'$, the expected gain to the firm and loss to the government for any $(r_g$, $L)$ are equivalent since the expected gain and loss functions are identical. (Note: $r_g \leq r + \varepsilon'$). The iso-gain curve FF of the firm will be everywhere to the left and above the government equivalent iso-loss curve when $r_m > r + \varepsilon'$. If $r_m < r + \varepsilon'$ the locus of $\bar{r}(L)$ is to the right and lower than $\bar{E}(L)$. We have noted earlier equation (7)) that when $r_g = r + \varepsilon'$ the government incurs no expected losses. If $\bar{E}(L)$ is to be the expected loss function used by government, and $r_m > r + \varepsilon'$ there exists a range of r_g such that $r_m > r_g > r + \varepsilon'$ and thus the government could have reason (profit motive) for being directly involved in the market for purposes other than the provision of social benefits. This is represented in Figure 1 by the negative sloping portion of the iso-loss curve which is actually a gain (negative loss). However, since financial profits are not stated motive of most government aid agencies we shall concern ourselves with the lower portion of Figure 2. From the point of view of this analysis any $r_g < r + \varepsilon'$ may be justified by the existence of external social benefits. If the external benefits are just sufficient to offset the difference between the expected direct return on the loan, $r_g - \varepsilon'$, then from equation (8):

(13) $E(\text{Benefits}) = E(r_g) + E(\text{S.B.})$

$= r_g - r' + E(\text{S.B.})$

$= E(\text{cost})$

$= r$

alternatively,

(14) $r = r_g - r' + E(\text{S.B.})$ or $r_g + E(\text{S.B.}) = r + r'$

(Note: for our purposes, it is not necessary to convert E(S.B.) to an interest rate since we require only that $E(\text{S.B.}) > 0$).

Figure 3 combines Figures 1 and 2 to illustrate the results.

In Figure 3, the F(G) locus and E(L) locus are drawn for equal implicit subsidy values between E(L) and $\bar{G}$. Where $r_g^* = r+r'$ there are no losses to the government. The asymtotes of E(L) are at some $r_g \gtrless r+r'$ as determined by the value of social benefits. As the social benefits of the venture approach zero the iso-loss curve tends towards the line r+r'. Where $r_m = r + r'$, $\bar{F}(G)$ and E'L' coincide.

If the loan rate is less than the <u>risky</u> social discount rate, losses are incurred which are the payment for social benefits.

If $r_m > r + r'$, we have a very strong conclusion. Since every (r_g , L) combination to the right of F(G) represents a greater present value of aid to the firm and every (r_g , L) combination to the left of E(L) represents a lesser loss to government, there exists a set of Pareto improving combinations.

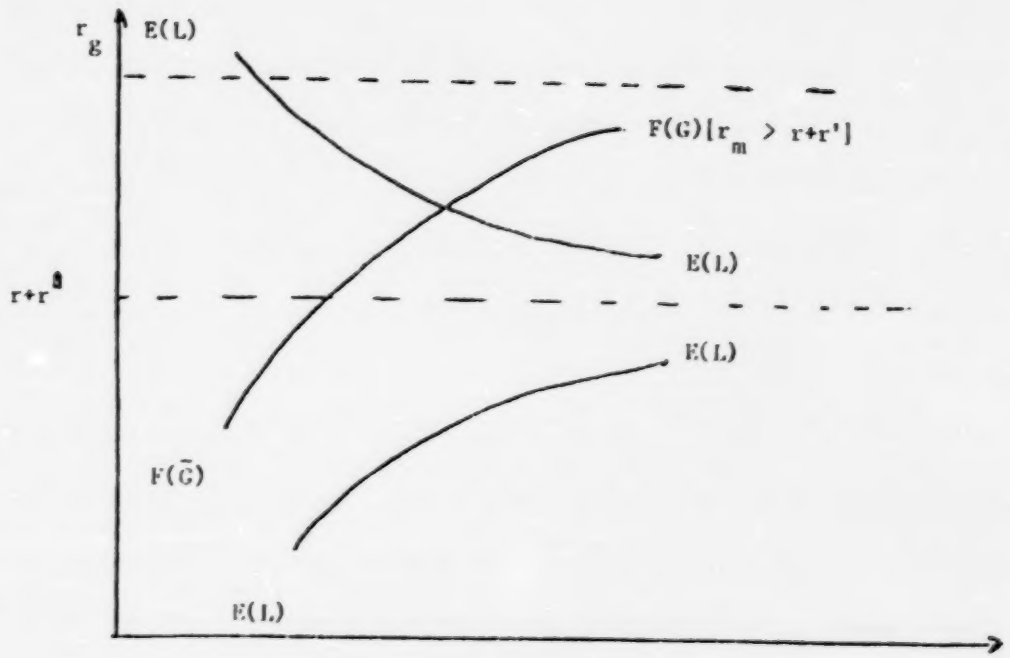


Figure 3

Loans and Grant Values

In particular, the firm is better off and the government no worse off if the firm requests loans along E(L). Thus the size of a direct government loan cannot be a unique measure of implicit benefits to the firm. Also the higher are the expected social benefits of the project, the lower can the rate r_g be set on any given loan. A government loan rate need not always be less than the risky social rate, but such a practice would be consistent with the principle of internalizing "externalities". Indeed it may be that the <u>incentive</u> required for a firm to undertake a venture would be a direct government loan at a rate $r_g > r + r'$, in which the government (at least over a number of similar projects) would incur a net financial gain as well as the firm (if $r_m > r_g$).

When $r_m \geqslant r + r'$ firms ought to seek financial subsidies in the form of government loans since the subsidy to the firm will always be at least as large as the alternative grant. The fact that grants do occur is not evidence that $r_m < r + r'$ however.

C. Grants

The government faces a very binding constraint to its loan programs; the size of the loan can be at most equal to the total cost of a given project. Also, the direct loan programs provide loans at rates which are generally of one to three percentage points less than market rates and with maturities of eight to ten years in most cases. The implicit subsidy[4] for a loan L with

(i) $r_g = 12$, $r_m = 15$, $n = 10$ is about 12% L

(ii) $r_g = 12$, $r_m = 14$, $n = 10$ " 8% L

(iii) $r_g = 12$, $r_m = 15$, $n = 8$ " 10% L

(iv) $r_g = 12$, $r_m = 14$, $n = 8$ " 7% L

It is clear that such lending policies can offer only marginal incentives to prospective investors. The case becomes stronger as the possible loan size decreases from 100% of the total project cost. Since public lending agencies are not conceived as being lenders of first resort, the proportion to be financed by government loans is generally less than 100% of the total project and the value of the implicit subsidy is reduced accordingly.

Grant programs differ markedly. Grant limits are cast in terms of 25 per cent to 50 per cent of eligible capital costs of projects, and usually include the cost of new machinery, equipment and construction. For research and development projects,

the amount of a grant is usually based on 50 per cent of both operating and capital costs. In general, the value of grants represents a much larger proportion of the total value of an eligible project than does the implicit subsidy of direct loans.

Now reconsider

(14) $r_g + E(S.B.) = r + r'$

which holds if government sets E(L) = E(S.B.). Let

(15) $r_m = r + r'$

The market rate ought to equal the risky social rate if the market is to be efficient in representing the social rate of return. If the capital market is not efficient in this sense then the market rate for a given project will be greater than the social risky rate. Thus

(16) $r_m = r + r' + z$

where z represents the difference between the market loan rate and the social loan rate. Combining (14) and (16) yields (17):

(17) $r_m - r_g = z + E(S.B.)$

The difference between the market rate and the government rate ought to be equal to the difference between the market rate and risky social rate plus the social benefits (appropriately expressed) of the project. If social benefits are positive and desired loan rates are equal (z=0), then the government rate can be lower than the market rate. If there is a divergence between desired loan rates ($z > 0$) then even in the absence of project related externalities, there is a capital market efficiency argument to justify a preferred rate government loan.

The rationale for grants in our model is obvious: if government is constrained such that $r_m - r_g$ cannot exceed three percentage points, those projects with a high z + E(S.B.) cannot be sufficiently subsidized to cover all social benefits. When not so constrained by the interest rate, however, direct loans can have very large implicit subsidies. For example, a ten year loan at zero per cent when the market rate is 15 per cent leads to an implied subsidy of 50 per cent of the loan.

We also note that z can be related to the benefits of risk pooling and risk spreading on the part of the government. We can consider r' to be the risk associated with the project proper and z the portfolio or financial risk associated with the variation in the cash flow of the private lender's portfolio. Clearly, z tends to zero when the market is capable of the same degree of risk spreading and risk pooling as the public sector. Thus public loans to the private sector might be considered appropriate even when no social benefits are expected if z is greater than zero. They are inappropriate if both z and E(S.B.) are zero.

One could also define an efficient capital market to exist when the riskless social rate (or the government borrowing rate as used in our context) is equal to the riskless market rate. In this case, the difference between the actual market rate and the risky social rate occurs through asymmetric evaluations of the risk of the project itself. Indeed the firm has

incentive to understate the risk (minimize the perception of $r + r'$) while the government has incentive to overstate the risk of the project. Thus even under a perfect capital markets assumption, r_m can differ from $r + r'$ for a particular project. Such a rationale for loans presents very real hazards, however. Any r_g such that $r_m > r_g > r$ could be defensible on any size loan for any project without arguing net social benefits or market imperfections but simply that government assessed project risk is much less that the market assessed risk.

In the model discussed above, subsidies are based upon social benefits generated by externalities other than risk and thus the problem does not arise. The issue of who can best assess project risk becomes a critical question when stated public policy is to undertake "more risk" in the economy.

To reiterate, to the extent that r_m may be greater than $r + r'$, firms may request subsidies through loans when the size of the subsidy is not constrained to be less than that of a grant program.

D. Alternative Financial Aid Instruments

We now briefly consider other instruments of public assistance to business; in particular, loan guarantees, interest rate rebates, forgiveable loans, interest free loans, deferred payment loans, and equity participation.

Loan guarantees and interest rate rebates have the same constrained subsidy values as do preferred loans analyzed above. Thus these three can be considered as close substitutes. (However, they do involve different financial flows for the government and may have different impacts on the financial markets.)

Forgiveable loans and grants are also close substitutes since, in general, a forgiveable loan becomes forgiveable if the project is successful (as defined in the terms of the loan) and is seldom recovered in full in the event of failure. It differs from a grant in that there may be less of a moral hazard effect in using forgiveable loans.

Interest free loans and deferred payment loans are significantly different from grants or direct loans. They may cover a larger portion of total financing requirements than a direct grant (that is, more than 25 to 50 per cent of eligible capital costs) and at the same time provide as much of a subsidy as would the possible grant. We illustrated earlier how an interest free loan could provide a subsidy of 50 per cent of the loan value. When the size of the loan is not bounded by the same definition for eligibility as is the grant, the implicit subsidy may well be larger than the project's possible grant. Similarly we can consider a deferred payment loan in which payments

commence only five years after the loan is received. When the market rate is 15 per cent, the present value of the loan at the end of the fifth year is about 50 per cent of its face value. Such notes, interest-free loans and deferred payment loans can provide more total financing than grants and at the same time have large implicit subsidies.

Equity participation by governments has been considered more fully by Mintz (1980). We offer only two observations. Equity participation differs from grants in that equity generally implies some rights which grants do not. Thus, when a proposed grant is given in terms of equity only marginal differences exist whether from the firm or government point of view. Indeed if the government is a last resort for financing, equity participation ought to be acceptable to the firm. If there is no reason to limit the proportion of equity financing by government relative to total equity financing then total government ownership of all firms would (presumably) eliminate any difference between market and social rates as well as allow for the internalization of all external economic effects.

E. Conclusion

Both loans and grants can be used as policy instruments by the government as incentives to private investments which provide net social benefits. We have argued that the absolute size of loans together with interest rate restrictions constrain the implicit subsidy which can be issued. Grants (in Canada) can

offer greater investment incentives. A large range of alternative instruments which do exist in Canada are capable of providing virtually any level of desired subsidies. One cannot, however, distinguish one type subsidization as being appropriate for a certain type of project.

The results of our analysis must be treated with caution. They are acceptable only to the extent tht debt-equity ratios and cash flows for both firm and public agencies have second order effects on these agents' decisions. We note, in particular, that in 1979 approximately $3 billion was issued in government loans which contained approximately $100 million in subsidies to firms. About $300 million was issued in grants. But $12 billion represents 60 per cent of funds raised by now-financial business in 1979. The impact on private financial markets of shifting from public grant to public loan programs cannot be assumed to be trivial.

F. An Example

In this section we consider a numerical example of the choices involved between grants and loans. We will also develop further the policy implications of constraints on government loan programs.

We shall consider a recent grant agreement between the Michelin Tire Company and the Federal plus Nova Scotian governments. In this agreement, $400 million was the total investment expenditures to be made by the firm. A total grant of $56 million was awarded. One penalty clause stated that the firm would lose $30,000 of grant for each full time job not produced out of the total expected positions of 1850. A second penalty clause stated that any reduction of total investment expenditures would reduce the grant by 14% of the shortfall in total investment. We note that the total implicit value of jobs expected was $55.5 million. Also, the value of the grant was 14% of the total investment planned.

We shall construct a family of iso-gain curves for the firm as well as iso-loss curves for the government. The iso-gain curve is given by,

$$(1) \qquad F(\bar{G}) = L\left(1-\hat{r}_m/\hat{r}_g\right)$$

therefore

$$(2) \qquad L = F(\bar{G})/\left(1-\hat{r}_m/\hat{r}_g\right)$$

Table 1 gives the values of L for a $1 subsidy at different rates r_m and r_g.

TABLE 1: DISCOUNT FACTORS (Loan of 10 Year Maturity)

A.

r %	8	9	10	11	12	13	14	15	16	18
$\hat{r}$	6.71	6.41	6.14	5.88	5.65	5.42	5.21	5.01	4.83	4.94

B. $(1-\hat{r}_m/\hat{r}_g)$ = F(G)/L= subsidy per $L

$r_g \backslash r_m$	8	9	10	11	12	13	14	15	16	18
8	x	.0436	.0343	.1224	.1576	.1914	.2227	.2521	.2798	.3303
9		x	.0426	.0824	.1196	.1545	.1873	.2180	.2470	.2998
10			x	.0416	.0805	.1170	.1512	.1833	.2135	.2687
11				x	.0406	.0787	.1143	.1478	.1794	.2370
12					x	.0297	.0768	.1117	.1446	.2046
13						x	.0387	.0751	.1093	.1718
14							x	.0378	.0734	.1384
15								x	.0370	.1046
16									x	.0702

C. $(1/1-\hat{r}_m/\hat{r}_g)$ = L/F(G)= $L required for $1 subsidy

$r_g \backslash r_m$	8	9	10	11	12	13	14	15	16	18
8	x	22.935	11.863	8.169	6.337	5.224	4.490	3.9666	3.673	3.027
9		x	23.474	12.135	8.361	6.472	5.339	4.587	4.048	3.335
10			x	24.038	12.422	8.547	6.613	5.455	4.683	3.721
11				x	24.630	12.706	8.748	6.765	5.574	4.219
12					x	25.188	13.020	8.952	6.915	4.887
13						x	25.839	13.315	9.149	5.820
14							x	26.455	13.623	7.225
15								x	27.02	9.560
16									x	14.245

Chart 1 illustrates the family of iso-gain curves with varying r_m for a one dollar gain (subsidy) to the firm. For example, if the market rate available to Michelin were 15%, a one dollar subsidy could be generated by a loan of $10 at a government rate of 12.4% (approximately). Since L and F(G) are linearly related (equation (9)) then a $56 million subsidy would require a loan of $560 million. If the market rate were 14%, a one dollar subsidy would be obtained through a loan of $7.146 at a government rate of 10.5% (approximately). A $56 million dollar subsidy implies a $400 million dollar loan at the same rate. That is, Michelin would have to have been offered a $400 million loan at 10.5% if the market rate faced by the firm were 14% to make it indifferent between this and a grant of $56 million.

Consider the government's iso-loss curves

$$E(L) = L\left(1-(1-p)\hat{r}/\hat{r}_g\right) \tag{3}$$

but $(1-p)\hat{r}$ is equivalent to $(r + r')$ since $(1-p)\hat{r}$ is the discount factor for the risk adjusted social rate. Suppose that $r + r'$ is less than Michelin's market rate. Let r_m = 15%, $r + r'$ = 14%. The government's iso-loss curve is given by the r_m = 14 locus in Chart 1. It is everwhere to the right and lower that the firm's iso-gain curve (r_m = 15%) for equal subsidy-loss values respectively. That is, the government would be willing to give a loan of $10 at a rate of 11% with an expected loss of $1. The firm would accept a rate of 12.4% on the same loan for an expected gain of $1.

CHART 1

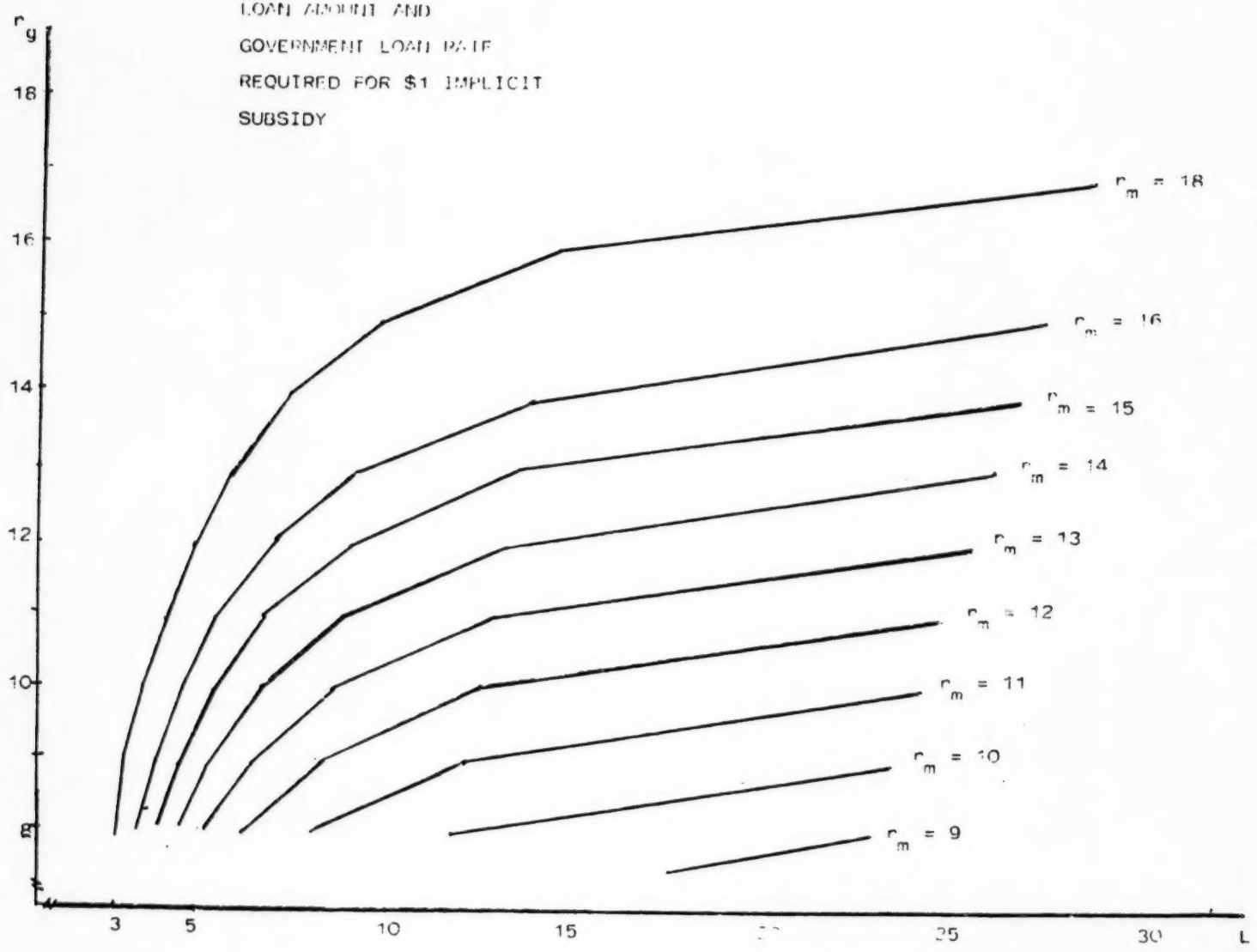
ISO-GAIN CURVES:

LOAN AMOUNT AND

GOVERNMENT LOAN RATE

REQUIRED FOR $1 IMPLICIT

SUBSIDY



Policy is therefore obvious.

(a) If r_m for the firm is greater than r + r' then loans can be made to the firm on the basis of the firm's iso-gain schedule. This may imply a net expected gain for the government since r_g may be greater than r + r'. This policy always ensures that the government's expected loss is less than the maximum it would be willing to lose. This policy therefore implies that, in these conditions, firms can be induced to internalize some of the costs of acquiring the desired social benefits.

(b) If r_m = r + r', the firm and government iso-gain and iso-loss curves are coincident. Any point along the relevant iso-loss (gain) curve is viewed as equivalent loss (gain) to the respective parties.

(c) If r_m < r + r', government ought not issue a loan since the expected loss of a loan acceptable to the firm would always involve an expected loss greater than the expected gain to the firm and therefore an expected loss greater than that of a grant which would be acceptable to the firm. That r + r' is greater than r_m is not perverse. If the risk premium is based on risk of the project and not the overall position of the firm in the market then project risk may be greater than the difference between r_m and r. An argument can be made therefore for the issuing of grants to large firms considering risky projects which produce external social benefits.

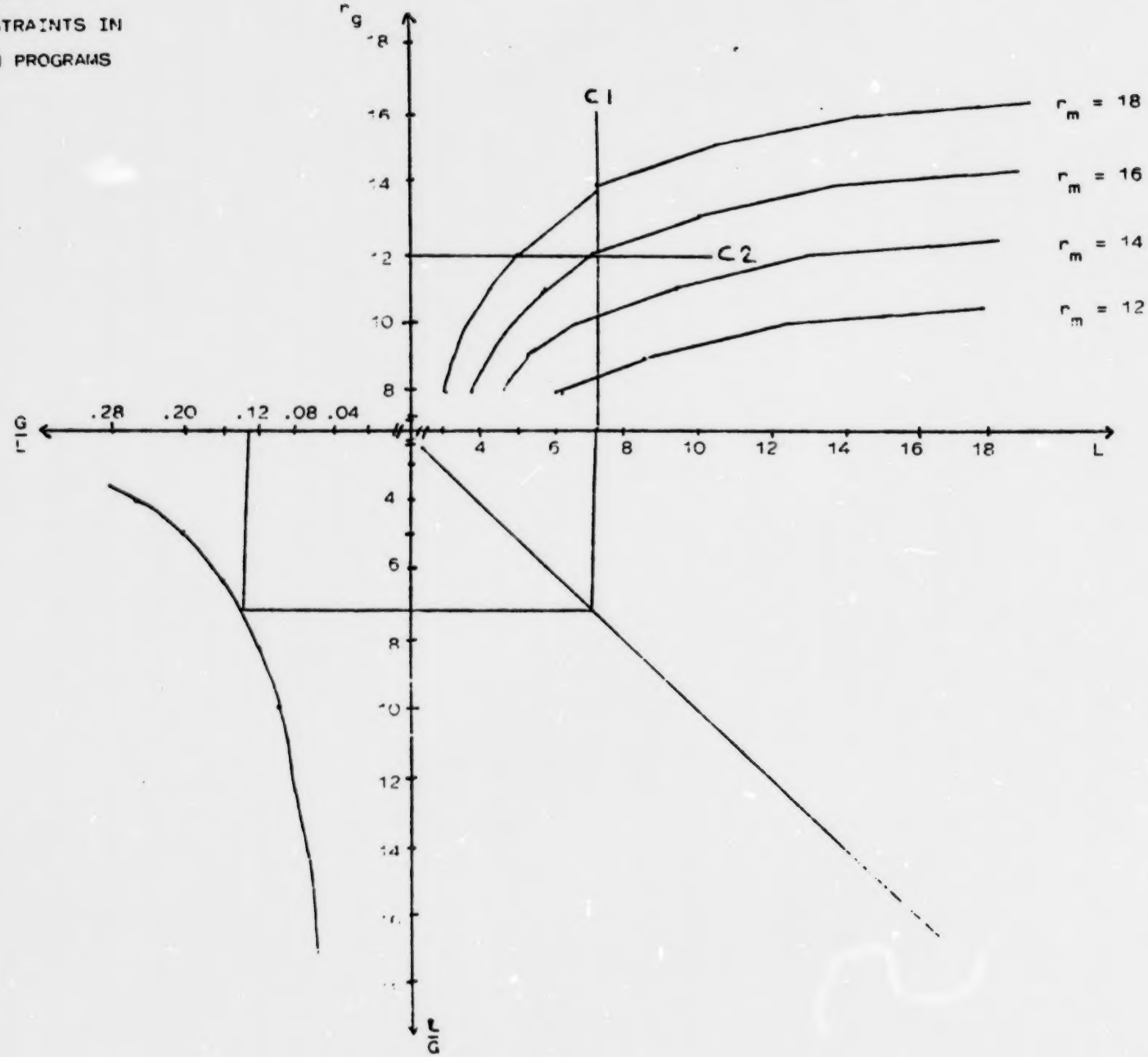
We turn our attention now to the effects of constraints on government policies with respect to both absolute loan size and interest rate minima or maxima. In Chart 2 we include the ratio of grant to loan size. The curves in Chart 2 have been constructed free hand and should therefore be considered as illustrative only. Results we derive will be approximations.

Given the level of social benefits desired, say G, and given the size of the project, say L, where L is also the maximum loan the government would be able to issue then the set of possible loans is clearly defined in Chart 2. We consider only the case in which $r_m > r + r'$ and that policy will be based upon the iso-gain curve of the firm. (We assume that the government knows the market rate facing the firm.) Using the Michelin example G/L = .14 or L/G = 7.148. The line C1, represents the constraint that the loan agency may not lend more than $400 million. In general, without a lower limit to the rate the government can charge, the above constraint may never be binding. (It will be binding in those cases where the G/L ratio is sufficiently high to warrant a non-positive government rate.) In our example it is clearly not a binding constraint. However, most loan programs are required to set rates at prime plus. The lowest prime rate in 1979 (when the Michelin case was studied) was 12% (Bank of Canada Review). This lower limit constraint on r_g is given by C2 in Chart 2. Eligible loan-rate combinations are above C2 and to the left of C1. If this is a lower bound r_g then the argument in favour of a loan to Michelin as opposed to a grant would have to be based upon a market rate for the project of at least 16%.

CHART 2

CONSTRAINTS IN

LOAN PROGRAMS



(Note that this would have been impossible using the class of loans we are studying in that the rate differential is greater than 3 per cent.)

It is clear from Chart 2 that as the grant/loan ratio increases or/and as the minimum rate constraint increases, appropriate loans are possible ony to the extent that the market rate of interest relevant for the project increases. Although one could explore in greater detail the policy implications of various constraints we shall complete our discussion with a note about the possible use of a chart such as we have constructed.

Suppose that a firm requests a ten year loan of size L at rate of say 13% because he would otherwise have to borrow at a rate of 16% which he is not willing to do. We would immediately be able to say that such a loan would be equivalent of a grant of .1L (r_g = 13, r_m = 16 intersect at L = \$10 per \$1 grant). But what are the net social over private benefits of the project?

This is the "Catch-22" of subsidy schemes. Net social benefits defined <u>a priori</u> in terms of "new" private investment or full time jobs created are general and may be unwarranted in specific cases. Net social benefits defined for each specific case allow firms to substantiate as best they can the net social benefits in the request for a grant or loan. Subsidizing agencies must make decisions based largely on information provided by the firm. While we do not attempt to define social benefits in any way, Chart 2 can put into perspective the value of social benefits required to justify given loans as well as the types of government loans which might be required to attain given levels of net social benefits in lieu of grants.

FOOTNOTES

1. We dismiss moral hazard considerations.

2. This is not to be construed as implying that the grant programs have a large role in the ultimate investment decisions taken however. See Ernst and Whinney (1980).

3. Note again that the gain above is the minimum expected gain to the firm.

4. The subsidy factor is $(r_m - r_g)/r_g$ where r_m and r_g are the appropriate factors of a present value of an annuity table.

CHAPTER IV

ALTERNATIVE ECONOMIC RATIONALES FOR GRANT PROGRAMS

In chapter 1 we presented an overview of government grant programs in terms of their immediate policy objectives. Underlying these objectives, there are alternative economic rationales that may be used to justify government intervention. In this chapter we consider the following economic rationales:

(i) the lowering of fixed costs,
(ii) the expansion of markets,
(iii) the existence of credit gaps,
(iv) distributive goals, and
(v) allocative goals.

1. The Lowering of Fixed Costs

Because of high initial fixed costs associated with a proposed business venture, private lenders may question its economic viability and decline to provide adequate funding. Were the proposal to go forward, the marginal costs of production would be such as to allow the firm to compete successfully. If it can be shown that social benefits would result from the venture, government grants may be justified. If social benefits are not the issue, then the argument is misplaced.

Full private financing would require that <u>average total costs</u> (including the required rate of return on capital) be recouped within a desired time frame. We suggest,

however, that average fixed costs are in general much less than average variable costs and that government grants which permit a reduction in average fixed costs (from the firm's vantage) are relatively small (and naturally decrease over-time as output increases) with respect to variable costs. Thus grants to firms in the absence of social benefits must be considered as marginal incentives at best, and further, must be justified in terms of a divergence between the risky social rate of return and the market rate. That is, $z > o$. Grants which are made in order to reduce fixed capital costs ought not be made to firm's as investment incentives vis a vis locational preferences if these preferences are based upon variable cost differences between locations. In particular, grants ought not be used as locational investment incentives where costs related to transportation are the reason for the preferences. Regionally motivated grants must therefore be based upon a concept of social benefits of income redistribution. If such a concept is used by a granting agency, the value of a grant must be the value of social benefits generated by expected income redistribution less the value of the allocative inefficiency that may be created.

2. Increased Exports

The strength of the Canadian Export industries is considered an important aspect of the Canadian economy,

but this, of itself, does not imply that special treatment ought to be accorded to it relative to the non-export sector. One can consider two types of grants to the export sector; capital grants for new or expanded product lines, or "marketing" grants which we define as being grants to offset the cost of finding or defining new export markets as well as grants to firms in order to offset the cost of attendance and exhibitions at trade fairs.

We shall overlook the first rationale above suggesting that an analogous argument to that in the previous section could be made where inter-regional considerations are replaced by inter-industry considerations. (We note also that subsidies to exporters are often argued to be subsidies to foreign buyers.)

The second rationale, support in defining new export markets and participation in trade fairs, may be justified as producing social benefits in that it serves to promote foreign participation in the development of the Canadian economy. In some sense national representatives at trade fairs and in trade missions are Canadian ambassadors.

3. The Removal of Credit Gaps

A credit gap is said to exist when borrowers similarly situated with respect to the market criteria employed for assessing the credit worthiness of borrowers and for

projects to be financed (e.g. financial structure, cash flow, risk etc.) are treated dissimilarly by lenders. Such treatment usually is reflected by a borrowers inability to obtain financing at "reasonable" terms and conditions. Dissimilar treatment received by borrowers, that is credit gaps, may be the result of monopoly, the regulatory environment, lender's portfolio preferences, or imperfect information.

Let us assume that existing financial regulations are appropriate for the objectives they pursue. Although financial market dislocations and hence external diseconomies may result from such regulation, we further assume that the diseconomies so created are smaller than the costs of deregulation. Under such circumstances credit gaps may be closed by use of alternative government instruments such as direct loans and grants to private sector businesses.

If the existence of a credit gap is the result of a divergence between government (public) and the private assessment of risk due to imperfect information, a case can be made for government financial assistance as a means of providing information to the private sector.

In either case, regulation or imperfect information, the credit gap argument is captured by the "z" in our model.

4. Distributive Goals

The Department of Regional Economic Expansion (DREE) is the main agency with the specific goal of regional redistribution of income. Through financial incentives to business it attempts to affect the regional preferences of new or expanding firms so that locations in the relatively under-developed regions of Canada are selected.

The redistributive goals of DREE are usually stated in terms of new employment created. We can distinguish two distinct rationales for direct government assistance to industry which serve to achieve the desired goals; first-mover incentives, and infant industry incentives. Since government grant assistance to most firms is a "one shot" incentive, the venture supported must be viable in the long run if it is to produce permanent employment. The "first-mover" argument suggests that a firm could be encouraged to locate in a DREE preferred location given an incentive to do so. Such an incentive is not given because the firm or venture is not viable in the preferred location but because it would not occur in that location without incentive. In this case, the social benefits of increased employment and income in the designated region is considered greater than the same employment benefits foregone in an alternate region because of distributional weights.[1] In the second case, it is argued that a firm or venture could be viable in the long run if increasing return to

scale were anticipated. Thus startup costs may represent a "risk" barrier to entry. "Excessive" startup costs could also be argued to fall under the heading of imperfect information or "credit gaps". The infant industry argument is devoid of regional implications. (Subsidies become an issue in productive efficiency.) The imperfect information and "credit gap" arguments imply $z > o$ as discussed previously.

5. Allocative Effects

The desired allocative effects of grant programs are simple; (a) increase employment in a given region; (b) increase output of a given sector; (c) increase the competitiveness of the secondary manufacturing industries. The impact of the grant programs in terms of resource allocation is not so simple to analyse.

On a macro-economic scale one would like to assess two outcomes; the effects of grants on total domestic investment, and the effects of grants on the mix of investment between sectors or industries. Since grants are made to specific firms or ventures and since the total value of such grants is relatively small, it is not clear that a macro-economic model could appropriately answer the questions. Also, in the absence of a strictly formulated industrial strategy there are no norms or goals with which to compare actual outcomes. This, we suggest, may be the

most problematic aspect of a macro-economic analysis. More costly programs do exist with underlying industrial objectives; namely the corporate tax structure with its various investment incentives. Even here little solid evidence exists with respect to impacts of these incentives.[7] Although the desired economic effects are micro-economic in definition, analysis in these terms is beset a lack of allocative coordination between programs and a relatively small total size of grant assistance.

There exist localized allocative effects which, although not analysed here, may be of interest to other researchers. First, we suggest that the price of capital goods is determined in a larger Canadian or international market and that additional demands created by grant programs have no effect on the price of capital goods. In the locale of the venture supported by a grant, the demand push on local labor markets may cause a rise in local wage rates for some types of employment. Applying the relevant analogy to specific sector or industry programs one must ask the extent to which the demand for specific types of labor is kept artificially high.

A concept which has received much attention is "incrementality"; defined as being the increase in investment expenditures which is directly attributable to the grant (or loan) incentive. This concept is particularly difficult to define empirically since all that was invested

from private sources could otherwise have been invested elsewhere (by region or sector) in the economy. "Incrementality" seeks to measure the change in private investment for a change in public assistance. To measure such a change requires, at a minimum, a model which could disentangle the effects of the tax structure on investment expenditures. As alluded to above, there are still difficulties in the latter task.

Finally we consider allocative effects in financial markets. As discussed in Chapter II, the loans required to generate an implicit subsidy equal to the current levels of grants would be sufficient to affect the interest rates in financial markets. Further, debt-equity ratios are more drastically changed for equal subsidy values under a program of direct loans. We suggest therefore that the most important allocative effect of grants may be the absence of large direct influences on the financial markets, and on the debt-equity ratios of recipient firms.

6. Conclusions

A common thread in the preceeding discussion has been the necessity for social benefits to exist in order to justify government financial assistance to private ventures. Although we discuss the "credit gap" concept we do not argue that this should be an overwhelming consideration given the financial environment of Canada.

Whatever the semantics used, the gist of the argument for financial assistance remains the social benefits made possible.

The arguments put forth for financial assistance do not mitigate in favor of loans or grants (or any other specific alternative). The choice of instruments must depend on the level of assistance desired and not primarily on the total value of the project.

The impacts of grant type assistance are not readily determined either as an allocative process or as a distributive process but may be more important for the distortions not otherwise encountered by the use of direct loans.

FOOTNOTES

1. An interesting effect of "first mover" subsidies is the inter-regional competition that can arise and the attendant effects on the sizes of grants available or offered.

2. See Appendix A.

CHAPTER V

CONCLUSIONS

The purposes of this paper were:

(a) to provide a statistical summary of capital grant programs;
(b) to provide a theoretical and conceptual basis upon which a grant system could be implemented;
(c) to provide some insight into the financial and real resource allocation, income distribution, and stabilization effects of the existing grant system;
(d) to discuss the use of grants as a government tool.

In chapters I and II we defined the concept of a grant and provided a statistical summary of existing grant programs. It was noted that grant programs are not directed towards capital grants uniquely and that the rationales of each individual grant program varied from support of research and development, definition of export markets, production and management improvement studies, as well as the pursuit of regional and sectoral objectives.

A theoretical basis for grants was constructed in chapter III. It was suggested that either direct government loans or grants could be used to secure social benefits in excess of private benefits but that the subsidy value of loans might be constrained so as to make grants an appropriate vehicle for subsidization. Alternatives to grants and direct loans were also discussed. Again, the rationale

for any public subsidy is based upon an excess of social benefits over private benefits. The range of the possible implicit subsidy values of these alternatives is great as well as the possible range of total financing of any given project. Their relationship to financial markets was not considered.

Chapter IV discussed the more common rationales actually given for grant (or alternative) subsidy programs. Each rationale was found to have a common denominator - an excess of social benefits over private benefits. Again the choice of an appropriate subsidy tool is determined by the publicly desired size of subsidy.

The effects on the allocation of real resources and income distribution were not discussed in detail. It was argued that real resource allocation effects could best be determined on a case by case analysis. Desired income redistribution effects have been analysed elsewhere and found to be very weak.[1]

The overall allocation of financial resources and in particular investment expenditures was considered as a fruitless inquiry due to the small value of grants. We suggest, however, that as a financial incentive to investment undertakings, grants have a much weaker effect (if any) on financial markets than would direct loans with equivalent implicit subsidies. This argument ought not to be taken out of context. The allocation of investment

expenditures brought about by grants may not have occurred had direct loans been the only alternative tool since the implicit subsidy of each possible loan may not have been sufficiently great to induce the desired investment. Given the alternative subsidy schemes which do exist there may exist a combination of schemes exclusive of grants which could be used without affecting financial markets.

Since this paper is only part of a larger study on government financial intermediation we have made suggestions as to the financial implications of grants. These can only be suggestions since we do not analyse the financial implications of government loans. Nor have we studied the various micro-economic financial implications for governments or firms involved with various types of financial aid. The main thrust of our discussion is to show that many types of government subsidization can be viewed as desirable if they indeed pay for social benefits. Regardless of the semantics used, purchasing social benefits must be the overriding presumption for social expenditures. Thus the principle issue of public aid to private business is not the type of aid used but the formulation of the total aid which is desirable from the social point of view.

FOOTNOTES

1. Gillespie and Kerr (1977). These results are also noted in Appendix A.

A GUIDE TO SELECTED STUDIES RELATING TO GRANT PROGRAMS

Two major reviews have been conducted with respect to the overall performance of ITC programs and DREE activities (Sharwood, 1976; Gillespie and Kerr, 1977). The former is an "inhouse" study, the latter an ECC study. Both studies contain an extensive in-depth look at the goals and results of grant programs as well as providing a well organized description of the various programs and the value of grants under these programs. We take liberty here in attempting to capsulize the general conclusions of each study.

With respect to the Department of Industry Trade and Commerce, it was suggested that a more centralized control system be implemented in order to ensure that grant policies would be consistent with a well-defined industrial strategy. It was also suggested that grants be primarily directed towards adjustment assistence, productivity, improvement, and to a lesser extent research and development. While we do not agree that sufficient economic analysis has been conducted with respect to each program's effectiveness we do agree that <u>if</u> there exists an industrial strategy which differs from that provided by the private market then the above conclusions with respect to these broad objectives are valid. We are not convinced, however,

that a "public" industrial strategy is to be preferred over the strategy provided by the private market.

The DREE analysis differs sharply from the ITC study in that it provides not only a descriptive analysis of the RDIA grant program but also an economic analysis of the results of this DREE program. Their major conclusion is that the designated lower income regions could have been made better off through a system of direct government transfers. The income transfers realized were less than those hoped for due to the patterns of trade between low and high income regions. Even worse perhaps, is the finding that the distributional effects on income were not found to be strongly related to "incrementality ratios". The authors argue that the incrementality ratio (the amount that capital investment increases as a result of grants, or the amount of full time jobs created which are directly attributable to grants) may be very close to zero. They have however analysed effects of the grant programs with much higher assumed incrementality ratios (up to 80 per cent).

The methodology of the study requires choosing values of certain parameters for the simulation of a neo-classical model. However, sensitivity analysis resulted in little variation in the results. We consider that the authors' conclusions are reasonable.

There are a number of other studies both theoretical and empirical which attempt to resolve the allocative implications of various grant programs. Woodward (1974A, 1974B, 1975) studies the capital bias effect locational DREE incentives in the RDIA. Usher (1975) also studies the impact of DREE incentives and derives much the same conclusions as Gillespie and Kerr although through a different route of analysis.

Mintz has conducted a number of studies dealing with state equity participation (1980a, 1980b).

In contrast to the studies above, Boadway and Flatters (1979) examine the theoretical implications of employment subsidies rather than capital subsidies. Ernst and Whinney (1980) provide valuable, though not necessarily quantifiable information on the effect of grants on the investment decisions of firms from the perspective of the businessman.

It was noted in the text of the paper that corporate investment tax incentives provide implicit subsidies to firms. Even though the forgone revenues of these tax incentives can be substantial (the value of grants pale in comparison) their real impact is not yet known.

The effects on investment expenditures of the corporation income tax and related investment incentives, such as investment tax credits and accelerated depreciation write-offs have been investigated and reported in numerous

publications.[1] There are few Canadian studies.[2] The Canadian results suggest that the tax parameters do affect investment behaviour but these results are only as dependable as the model (Jorgenson neo-classical model) used for investigation. Indeed, the Jorgenson approach is widely disputed in the literature. Moreover, some results suggest that the cost of tax incentives was often higher in terms of foregone tax revenue than the increase in expenditures generated.[3] Since changes in tax parameters lead to changes in the relative price of capital, one could anticipate changes in investment expenditures to be related to the elasticity of substitution for the industries subject to the changes. McDonough (1980) suggests that the elasticity of substitution is very low in at least five Canadian manufacturing industries. Bishoff (1969) found that for many US - industries the estimate of the elasticity of substitution was insignificantly different from zero or one. Thus, given the empirical investigations that have been reported, one is still unable to predict with any level of assuredness, the actual impact on investment expenditures of tax incentives. Given the relatively large value of foregone tax revenue in these cases as compared to the amount expended by grant type incentives, we suggest that the impact of the latter on investment is largely speculative, and at best, insignificant at the macro-economic level of inquiry.

Finally, we would be remiss in our responsibilities if we did not make note of the political environment in which public aid to private business occurs. For this one can refer to the paper by Woodside (1979) in which arguments are made for and against the use of tax incentives versus expenditure subsidies, (this includes implicit subsidies of government loans).[4] Tax incentives, it is suggested, can be introduced in "such a manner as to minimize the information provided to critics of the government".[5] Also, tax incentives are less liable to stringent review procedures. Tax incentives also appear to have less of a direct influence on the private sector than do expenditure subsidies and do not give rise to claims of government support of failing ventures. Finally, tax incentives can be quickly implemented (through a budget) and do not meet with much corporate disdain since, in general, these incentives favor firms which are sufficiently profitable to use them to advantage.

Expenditure subsidies on the other hand can be venture specific and thus focus more narrowly on specific targets which is less costly than universal tax incentives. Delays in the introduction of budgets and the changing of governments together with the uncertainty of the actual effects of broad tax incentives mitigate in favor of specific subsidy schemes. This uncertainty is increased as inflation reduces the value of capital cost allowances

and produces illusory corporate profits. Finally, distributional subsidies through DREE in particular receive great publicity and are becoming accepted as an essential ingredient for the Canadian political raison d'être.

FOOTNOTES

1. See Jorgenson (1971) for a survey of empirical studies. See also Helliwell (1976) and Brechling (1975) for more recent bibliographies.
2. Gaudet, May and McFetridge (1976) and McDonough (1980) have examined Canadian investment.
3. Harmon and Johnson (1979).
4. The following discussion attempts to paraphrase the article.
5. Woodside (1977) pg. 251.

REFERENCES

Bischoff, C.W.; "Hypothesis Testing and the Demand for Capital Goods", Review of Economics and Statistics, 1969, (354-368).

Boadway, R. and Flatters, F.; "The Efficiency Bias for Regional Employment Policy", Queen's University Discussion Paper, No. 341, 1979.

Brechling, F.; Investment and Employment Decisions, Manchester University Press, Manchester, 1975.

Ernst and Whinney, Chartered Accountants; "Government Incentive Programs in Canada: Are They an Effective Tool in Stimulating Investment in Productive Plant and Equipment"; Economic Council of Canada Discussion Paper No. 152, 1980.

Gaudet, G., May, J. and McFetridge, D.; "Optimal Capital Accumulation: The Neo Classical Framework in a Canadian Context", Review of Economic Statistics, Vol. 58.

Gillespie, I. and Kerr, R.; "The Impact of Federal Regional Economic Expansion Policies on the Distribution of Income in Canada", Economic Council of Canada Discussion Paper No. 85, 1977.

Harmon, F.J. and Johnson, J.A.; "An Examination of Government Tax Incentives For Business Investment in Canada", Canadian Tax Journal, 1978 (691-704).

Helliwell, J.F.; "Aggregate Investment Equation: A Survey of Issues", in Aggregate Investment, J.F. Helliwell (ed), Penguin Education, Markham, Ontario, 1976.

Jorgenson, D.W.; "Econometric Studies of Investment Behavior: A Survey", Journal of Economic Literature, 1971 (1111-1147).

McDonough, L.C.; A Forward Looking Model of Neo-Classical Investment Behavior with Application to Five Canadian Manufacturing Industries, Ph.D. Dissertation, Queen's University, Kingston, Ontario, 1980.

Mintz, J.M.; "Mixed Enterprises and State Equity Financing of Industry"; Queen's University Discussion Paper, October 1980 (See also Paper No. 325, 1979).

Mintz, J.M.; State Equity of Industry: A Theoretical Appraisal of Public-Private Mixed Enterprises, Ph.D. Dissertation, University of Essex, 1980.

Sharwood, G.R.; Evaluation of Industrial Support Programs, Department of Industry Trade and Commerce, 1976.

Usher, D.; "Some Questions About the Regional Development Incentives Act", Canadian Public Policy, 1975, (557-575).

Woodside, K.; "Tax Incentives vs. Subsidies: Political Considerations in Governmental Choice", Canadian Public Policy, 1979, (248-256).

Woodward, R.S.; "The Capital Bias of DREE Incentives", Canadian Journal of Economics, 1974a, (161-173).

Woodward, R.S.; "Effective Location Subsidies: An Evaluation of DREE Industrial Incentives", Canadian Journal of Economics, 1974b, (496-500).

Woodward, R.S.; "The Effectiveness of DREE's New Location Subsidies", Canadian Public Policy, 1975 (217-230).